

## Downtown Parking Analysis Report

### Introduction

The purpose of this study is to examine the actual infrastructure and use of parking in downtown Middletown. This report will also examine the density of parking in the downtown, best practices and offer some conclusions or recommendations about Middletown's parking environment.

This review contains the following discussions:

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### Methodology

This study is a point-in-time count of parked cars in downtown Middletown. Two days were selected, one to represent weekday parking demand and one to represent weekend parking demand. Each day was divided into four two-hour windows where counting of parked cars took place. April 11, 2006 was selected for the weekday count and April 22, 2006 was selected for the weekend count. The time periods were; 5am-7pm, 11am-1pm, 6pm-8pm and 10pm-12pm. These counting periods represent early morning activity, mid-day activity, early evening activity, and late night activity, respectively.

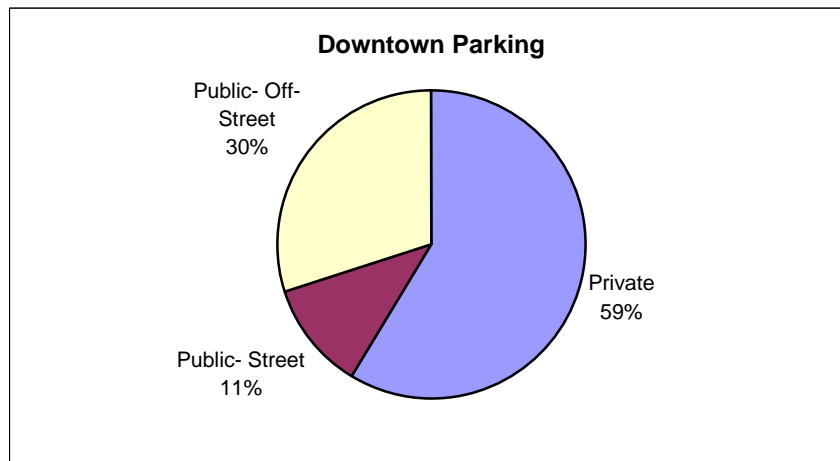
The study area includes a significant part of the downtown and the riverfront. This area is bound by Harbor Park to the East, Hartford Avenue and Spring Street to the North, Pearl Street to the West and Route 17 connector to the South. Both on street and off street facilities were included in this study. Driveways, some minor parking areas, Wetmore Place and Longworth Avenue were not included in the parking count. These were not included because the public at large would not likely park in these locations. For the purposes of analysis the downtown was divided into four areas, the North End (North of Washington), the Central Core (South of Washington and North of William/MLK Streets), the South End (South of William/MLK Streets), and the Riverfront (East of Route 9). Analysis was also done at the city block level and the site specific level.

In evaluating a parking area, 85 to 90 percent occupancy will be considered full since turnover is required for motorists to find a parking space.

### Parking Inventory

The total number of parking spaces in the study area equals 6,581.

Figure 1-Downtown Parking Inventory



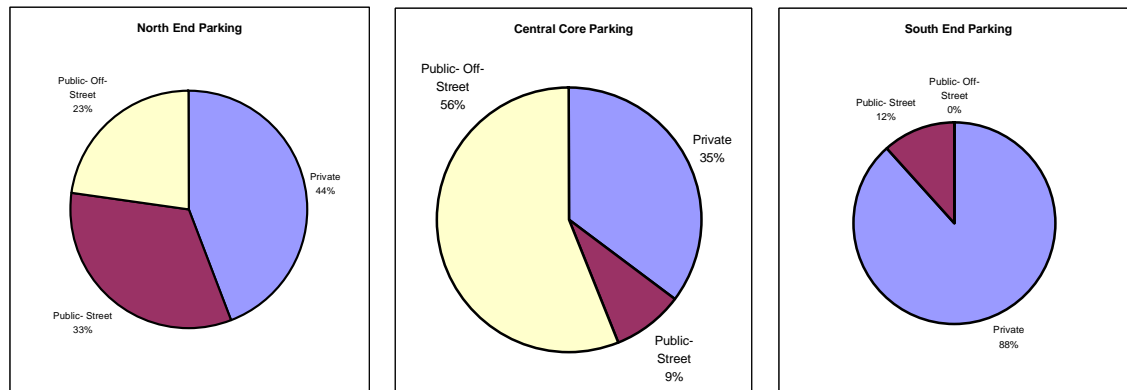
There are 2,706 public parking spaces, which equals 41% of the total downtown parking. Of this 754 are on-street parking with 1,952 being public off-street parking. On-Street parking represents 11% of the total parking downtown and equals 27% of the total publicly-controlled parking spaces. There are 283 parking spaces on Main Street. This represents 4% of the total parking downtown, 10% of the publicly-controlled spaces, and 38% of the on-street parking. Off-Street public parking represents 30% of the total downtown parking. The ten largest off street publicly controlled parking lots are:

- 1) 374 public parking spaces in Middlesex Mutual
  - 2) 365 spaces in the Court House garage
  - 3) 189 spaces in the lower level of the Arcade
  - 4) 177 spaces in the upper level of the Arcade
  - 5) 176 spaces in the Melilli Plaza parking lot
  - 6) 105 spaces behind KidCity Children's Museum
  - 7) 87 spaces in the City Hall employees lot
  - 8) 82 spaces in the Northern lot of Harbor Park
  - 9) 65 spaces in rear of the Police Station
  - 10) 55 spaces to the South of Eli Cannon's restaurant
- (The top ten public lots represent a total of 1,675 parking spaces or 25% of downtown parking.)

There are 3,875 privately controlled parking spaces in the downtown, which equals 59% of the total downtown parking. The ten largest off-street publicly controlled parking lots are:

- 1) 700 private parking spaces in Middlesex Mutual
  - 2) 298 spaces of surface parking at Middlesex Hospital
  - 3) 295 spaces at Metro Square
  - 4) 250 spaces in the four level garage at Middlesex Hospital
  - 5) 144 spaces at Rivers Edge Co-op
  - 6) 134 spaces in YMCA's lot south of James Moses Avenue
  - 7) 114 spaces in the rear of Middlesex Plaza
  - 8) 105 spaces in the rear of the Middletown Press Building
  - 9) 104 spaces in the YMCA lot
  - 10) 98 spaces around Middlesex Hospital 's 98 South Main Street
- (The top ten private lots represent a total of 2,242 parking spaces or 34% of downtown parking.)

Figure 2- Parking Inventory by Neighborhoods



The North End has 729 parking spaces, which equals 11% of the total parking downtown. Public parking represented 56% of the total parking in the North, which equals 407 parking spaces. The 241 on-street parking represents 33% the total parking in the North End and half of all public parking in the North End.

The Central Core has 3804 parking spaces, which equals 58% of the total parking downtown. Public parking represents 50% of all parking in the Central Core, and on-street parking (297) represents only 15% of the parking in the Central Core,

The South End has 1869 parking spaces, which equals 28% of the total parking downtown. The South End has no public off-street parking. 100% of the public parking is on-street which totals 216 parking spaces.

The Riverfront has 179 parking spaces, which equals 3% of the total parking downtown. The Riverfront has no on-street parking and all of the off-street parking is public.

### Weekday Parking Usage

During the weekday, downtown experiences a parking cycle similar to most commercial centers. The peak period is in the middle of the day with demand continuing into the evening at a lesser level and very little demand at night or early morning. Street parking is in higher demand than off-street parking. Main Street parking spaces are frequently at full capacity (85%) or higher at multiple times during the day. See Table 6.

Table 1- Downtown Parking Demand Cycles- weekday

Location	5am-7pm	11am-1pm	6pm-8pm	10pm-12pm
Downtown Parking (6581)	13% (828)	68% (4493)	37% (2415)	15% (1006)
On-Street Parking (754)	25% (192)	72% (546)	64% (480)	29% (221)
Off-Street Parking (5827)	11% (636)	61% (3582)	32% (1875)	13% (785)
Public Parking (2706)	13% (356)	90% (2448)	37% (1009)	14% (390)
Private Parking (3875)	13% (516)	74% (2872)	36% (1406)	16% (616)
Restricted/Pay Parking (1976)	3% (63)	60% (1181)	16% (322)	2% (41)
Free Parking Off Street (3851)	15% (573)	62% (2401)	40% (1553)	19% (744)
Main Street Parking (283)	18% (192)	76% (215)	<b>92% (261)</b>	32% (90)

Figure 3- Weekday Downtown Parking Demand Cycles

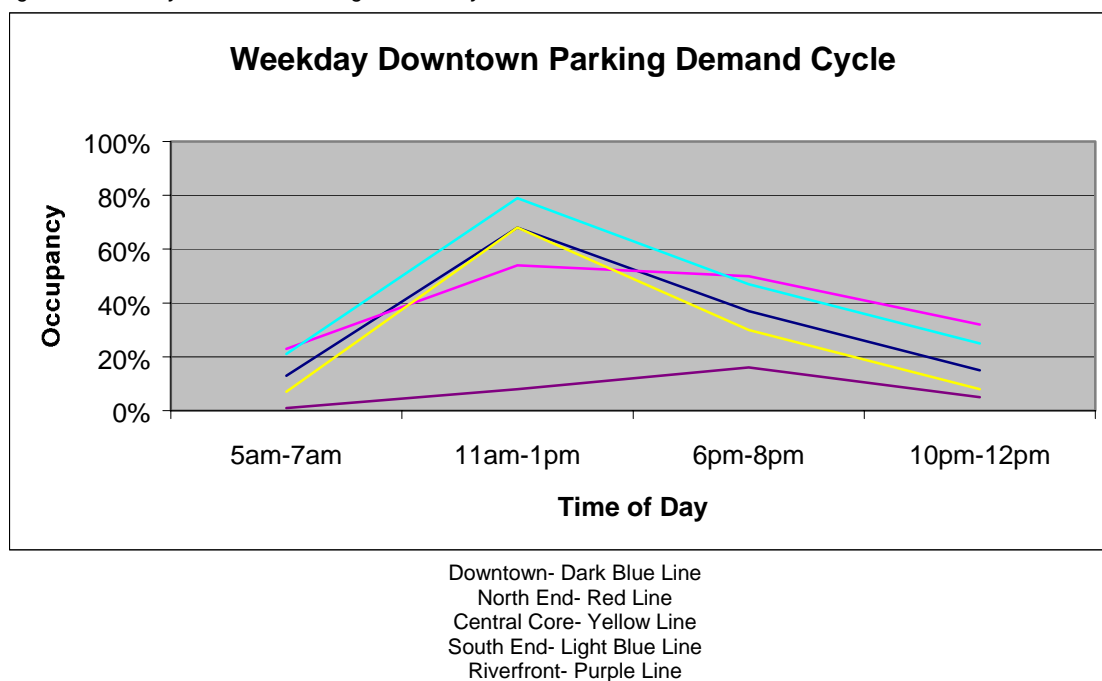
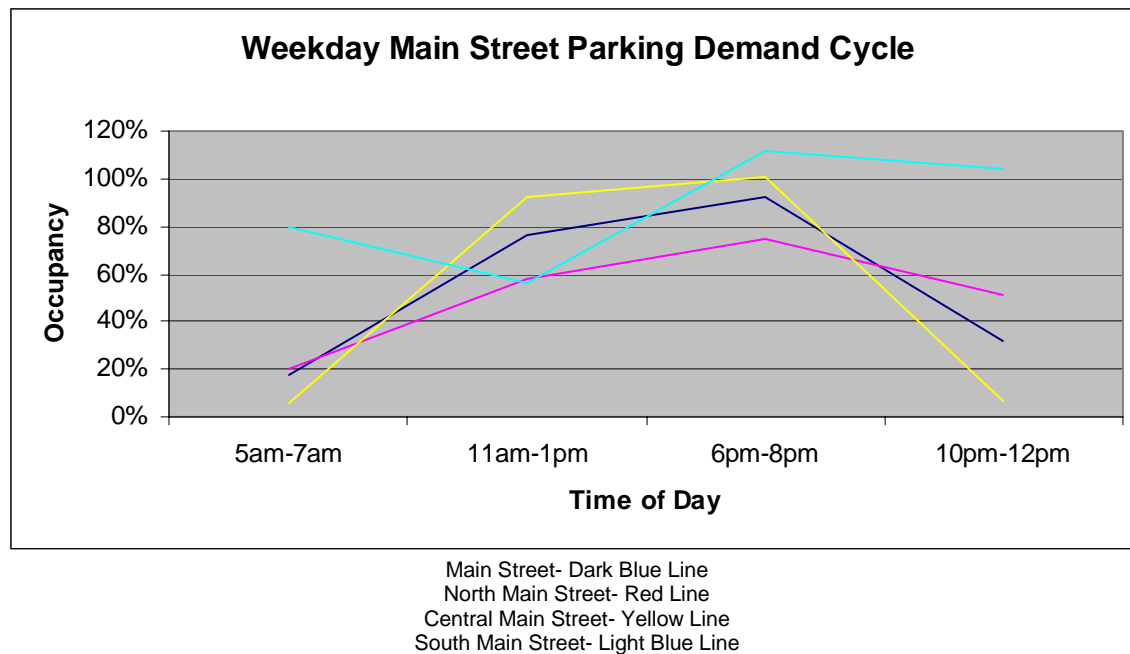


Figure 4- Weekday Main Street Parking Demand Cycles



The North End neighborhood of downtown experiences a relatively constant level of demand through out the weekday. This is a different experience than the other neighborhoods in the downtown, which will be discussed below. The mid-day is also the peak period, but demand continues to remain strong until late night, due to increasing number of restaurants and bars that stay open late, and residential parking needs.

Table 2- North End Parking Demand Cycles- weekday

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
North End Parking (729)	23% (166)	54% (395)	50% (362)	32% (235)
NE On-Street Parking (241)	33% (80)	52% (125)	60% (144)	50% (120)
NE Off-Street Parking (488)	18% (86)	55% (270)	45% (218)	24% (115)
NE Public Parking (407)	30% (123)	58% (237)	58% (238)	45% (182)
NE Private Parking (322)	13% (43)	49% (158)	39% (124)	16% (53)
NE Main Street Parking (104)	20% (21)	58% (60)	75% (78)	51% (53)

The Central Core weekday parking cycle experiences very little demand for parking in the early morning and late night. Mid-day and early evening are the peak periods. Parking areas serving businesses have their peak at mid-day and parking areas serving restaurants having their peak in the early evening. Main Street is well above full capacity throughout these two peak periods.

Table 3- Central Core Parking Demand Cycles- weekday

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
Central Core Parking (3804)	7% (274)	68% (2604)	30% (1141)	8% (298)
CC On-Street Parking (297)	13% (40)	82% (245)	80% (238)	14% (43)
CC Off-Street Parking (3507)	7% (234)	67% (2359)	26% (903)	7% (255)
CC Public Parking (1904)	7% (130)	77% (1474)	35% (664)	7% (141)
CC Private Parking (1900)	8% (144)	59% (1130)	25% (477)	8% (157)
CC Main Street Parking (154)	6% (10)	<b>92% (141)</b>	<b>101% (155)</b>	7% (11)

The South End's weekday parking cycles reflect the demands of the Hospital, Inn at Middletown and to a lesser extent the YMCA. The Hospital is predominantly served by off-street parking, and a number of these lots are at full capacity due to employee and visitor demand. The Inn at Middletown's clients take advantage of the Main Street parking section of the South End with demand well exceeding full capacity, even into the early morning and late night time periods. The YMCA impacts Union Street and their parking lot during the mid-day and early evening, but demand is still below full capacity.

Table 4- South End Parking Demand Cycles- weekday

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
South End Parking (1869)	21% (387)	79% (1479)	47% (883)	25% (464)
SE On-Street Parking (216)	33% (72)	81% (176)	45% (98)	27% (58)
SE Off-Street Parking (1653)	19% (315)	79% (1303)	47% (785)	25% (406)
SE Public Parking (216)	33% (72)	81% (176)	45% (98)	27% (58)

SE Private Parking (1653)	19% (315)	79% (1303)	47% (785)	25% (406)
SE Main Street Parking (25)	80% (20)	56% (14)	<b>112% (28)</b>	<b>104% (26)</b>

The Riverfront has little parking demand during the week, with the peak period around dinner time, as a result of visitors to Harbor Park Restaurant and the Boat houses.

*Table 5- Riverfront Parking Demand Cycles- weekday*

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
Riverfront Parking (179)	1% (1)	8% (15)	16% (29)	5% (9)
RF On-Street Parking (0)				
RF Off-Street Parking(179)	1% (1)	8% (15)	16% (29)	5% (9)
RF Public Parking(179)	1% (1)	8% (15)	16% (29)	5% (9)
RF Private Parking (0)				

Main Street as noted above sees the heaviest demand for its 283 parking spaces during the weekday. Table 10 shows that three of the top 8 parking locations in Middletown exist on Main Street, with demand averaging at full capacity throughout the day. Furthermore at least ten sections of Main Street are at full capacity at some point during the day. The section of Main Street across from the Inn at Middletown is the only location in the City at full capacity in the early morning hours.

*Table 6- Main Street Parking Demand Cycles- weekday*

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
Main Street (E)- Union/MLK (10)	70% (7)	70% (7)	<b>130% (13)</b>	<b>110% (11)</b>
Main Street (E)- MLK/Dingwall (29)	24% (7)	83% (24)	<b>86% (25)</b>	14% (4)
Main Street (E)- Dingwall/Court (14)	7% (1)	<b>121% (17)</b>	<b>114% (16)</b>	0% (0)
Main Street (E)- Court/Wash (37)	3% (1)	78% (29)	<b>111% (41)</b>	11% (4)
Main Street (E)- Wash/Ferry (24)	8% (2)	<b>100% (24)</b>	<b>100% (24)</b>	<b>92% (22)</b>
Main Street (E)- Ferry/Green (15)	67% (10)	60% (9)	40% (6)	53% (8)
Main Street (E)- Green/Rapallo (10)	0% (0)	50% (5)	40% (4)	10% (1)
Main Street (E)- Rapallo/Hartford (11)	64% (7)	82% (9)	73% (8)	36% (4)
Main Street (W)- Spring/Grand (12)	0% (0)	17% (2)	<b>100% (12)</b>	67% (8)
Main Street (W)- Grand/Liberty (11)	0% (0)	45% (5)	82% (9)	0% (0)
Main Street (W)- Liberty/Wash (21)	10% (2)	29% (6)	71% (15)	48% (10)
Main Street (W)- Wash/Court (37)	0% (0)	<b>103% (38)</b>	<b>97% (36)</b>	3% (1)
Main Street (W)- Court/College (10)	0% (0)	<b>90% (9)</b>	<b>100% (10)</b>	0% (0)
Main Street (W)- College/William (27)	4% (1)	<b>89% (24)</b>	<b>100% (27)</b>	7% (2)
Main Street (W)- William/Church (15)	<b>87% (13)</b>	47% (7)	<b>100% (15)</b>	<b>100% (15)</b>

Aggregating the parking by block, allows you to see how parking demand is affected at the City block level because of uses that exist in close proximity. For example the first block listed is the Hospital block south of Crescent Street, shows that demand is well above full capacity during the middle of the day, but sufficient spare capacity exists at all other hours of the day. Table 8 lists the city blocks that have the highest average parking occupancy during the entire day. The city block with the highest demand is the Ferry/Green Block, but at no point during the day is the demand at full capacity. The off-street parking does exceed full capacity, but on-street parking for the Ferry/Green Block still has available parking capacity to meet the need.

*Table 7- City Blocks Parking Demand Cycles- weekday*

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
Block # 24 23-42 Hospital (682)	16% (108)	<b>97% (660)</b>	50% (341)	26% (177)
Block # 24 23-39 Sterling (180)	19% (35)	69% (124)	65% (117)	19% (34)
Block # 34 24-9 YMCA (317)	14% (44)	<b>91% (289)</b>	30% (95)	8% (26)
Block # 34 24-5 Personal Auto (69)	25% (17)	68% (47)	36% (25)	36% (25)
Block # 34 24-1 Mdtwn Plate Glass (73)	1% (1)	47% (34)	3% (2)	1% (1)
Block # 24 23-25 Inn at Mdtwn (344)	40% (139)	47% (160)	60% (206)	46% (158)
Block # 24 17-56 Metro Square (380)	6% (22)	40% (151)	47% (177)	14% (55)
Block # 22 17-53 Court House (863)	9% (81)	81% (699)	18% (157)	10% (84)
Block # 22 17-52 City Hall (448)	6% (26)	71% (319)	60% (270)	9% (42)
Block # 22 17-47 La Boca (163)	9% (15)	55% (90)	39% (63)	26% (43)
Block # 22 17-37 Green St Arts Ctr (49)	57% (28)	65% (32)	73% (36)	53% (26)
Block # 22 17-36 Artist Coop (102)	41% (42)	67% (68)	38% (39)	48% (49)
Block # 22 17-29 O'Rourke's (51)	41% (21)	49% (25)	47% (24)	35% (18)
Block # 22 17-28 Eli Cannon's (114)	24% (27)	45% (51)	76% (87)	44% (50)
Block # 22 17-35 CHC (68)	18% (12)	54% (37)	38% (26)	18% (12)
Block # 22 17-46 Fire House (182)	12% (21)	51% (92)	48% (87)	20% (37)
Block # 22 17-51 Kidcity (397)	2% (9)	63% (249)	48% (190)	4% (16)
Block # 22 17-55 Mdlsex Mutual (1164)	4% (45)	76% (880)	9% (106)	0% (2)
Block # 24 23-30 Mdlsex Plaza (266)	16% (43)	74% (196)	51% (135)	19% (50)
Block # 24 23-34 Doolittle Funeral (204)	21% (43)	81% (165)	48% (97)	21% (43)
Block # 24 23-29 Broad St Books (186)	20% (38)	33% (62)	26% (48)	23% (42)
Block # 24 23-27 Gianni's Pizza (20)	35% (7)	65% (13)	55% (11)	30% (6)

Block # 22 17-50 Russell Library (95)	3% (3)	37% (35)	49% (47)	1% (1)
Block # 33 24-3 Harbor Park (179)	1% (1)	8% (15)	16% (29)	5% (9)

Table 8- City Blocks with the heaviest parking demand- weekday

Rank	Location	Neighborhood	Average occupancy %
1	Block# 22 17-37- Ferry/Green Block	North End	62%
2	Block# 22 17-37- Green/Rapallo Block	North End	49%
3	Block# 24 23-25- Union/MLK Block	Central Core	48%
4	Block# 24 23-42- Crescent/Rte 17 Block	South End	47%
	Block# 22 17-28- Spring/Grand Block	North End	47%
5	Block# 24 23-27- Court/College Block	Central Core	46%

Table 9- Selected Locations Around Downtown Parking Demand Cycles- weekday

Location	5am-7pm	11am-1pm	6pm-8pm	10pm-12pm
80 South Main Parking Lot (98)	1% (1)	<b>98% (100%)</b>	21% (21)	8% (8)
28 Crescent St- Hospital Parking (250)	6% (16)	<b>100% (249)</b>	72% (180)	22% (54)
28 Crescent St- Hospital Garage (298)	29% (85)	<b>94% (281)</b>	46% (137)	38% (113)
Street- South Main Street (E) (6)	17% (1)	<b>117% (7)</b>	17% (1)	17% (1)
Street- Main St Ext. (W) (30)	17% (5)	83% (25)	7% (2)	3% (1)
Street- Crescent St (N) (22)	45% (10)	<b>91% (20)</b>	82% (18)	41% (9)
Street- Crescent St (S) (5)	0% (0)	80% (4)	40% (2)	0% (0)
Street- South Main St (W) (13)	0% (0)	<b>85% (11)</b>	38% (5)	8% (1)
55 DeKoven Drive- YMCA (104)	23% (24)	76% (79)	70% (73)	15% (16)
1 James Moses Ave- YMCA-E2 (134)	0% (0)	<b>117% (157)</b>	7% (10)	1% (1)
Street- Main St Ext (E) (22)	27% (6)	<b>91% (20)</b>	18% (4)	14% (3)
Street- Union St (18)	39% (7)	44% (8)	0% (0)	0% (0)
100 Main St- Brooks- MLK (19)	0% (0)	68% (13)	<b>95% (18)</b>	0% (0)
Middletown Press Rear (105)	5% (5)	52% (55)	43% (45)	20% (21)
111 DeKoven Dr- Rivers Edge (144)	69% (100)	35% (50)	59% (85)	69% (100)
Street- Union St (N) (20)	60% (12)	80% (16)	75% (15)	50% (10)
130 Main St- Metro Square (295)	5% (15)	41% (122)	51% (151)	17% (50)
Court Street- Arcade Upper level (177)	0% (0)	61% (108)	32% (57)	3% (6)
Dingwall Dr- Arcade Lower level (189)	14% (26)	65% (123)	19% (35)	13% (24)
1 Court Street- Court House (365)	0% (0)	<b>100% (365)</b>	0% (0)	0% (0)
245 DeKoven Dr- City Hall Rear (22)	5% (1)	82% (18)	50% (11)	0% (0)
245 DeKoven Dr- City Hall Emp. (87)	1% (1)	78% (68)	16% (14)	1% (1)
Melilli Plaza (176)	10% (18)	81% (142)	<b>91% (161)</b>	15% (27)
74 Court St- Sons of Italy (27)	4% (1)	41% (11)	56% (15)	19% (5)
27 Washington St- DeKoven House (21)	14% (3)	71% (15)	76% (16)	14% (3)
512 Main St- La Boca Rear (50)	0% (0)	76% (38)	44% (22)	16% (8)
Street- Ferry Street (S) (18)	50% (9)	72% (13)	56% (10)	56% (10)
51 Main St- Green St Arts Ctr (18)	33% (6)	78% (14)	<b>89% (16)</b>	28% (5)
60 Green Street- Artist Coop Rear (39)	49% (19)	<b>95% (37)</b>	33% (13)	46% (18)
47 Rapallo Ave- Vacant Lot (22)	55% (12)	45% (10)	45% (10)	77% (17)
Street- Rapallo Ave (S) (14)	21% (3)	79% (11)	43% (6)	50% (7)
Street- Green St (N) (17)	47% (8)	29% (5)	35% (6)	35% (6)
Street- Rapallo Ave (N) (8)	50% (4)	<b>113% (9)</b>	50% (4)	75% (6)
675 Main St- Eli Cannon's Parking (55)	9% (5)	60% (33)	<b>89% (49)</b>	33% (18)
Street- Spring St (N) (11)	36% (4)	27% (3)	73% (8)	55% (6)
Street- Spring St (S) (18)	56% (10)	39% (7)	78% (14)	61% (11)
Street- Grand (N) (18)	44% (8)	33% (6)	22% (4)	39% (7)
631 Main St- CHC Parking (28)	0% (0)	82% (23)	21% (6)	0% (0)
Street- Liberty Street (N) (29)	41% (12)	31% (9)	34% (10)	41% (12)
465 Main Street- Luce Parking (51)	8% (4)	57% (29)	82% (42)	18% (9)
515 Main Street- Sal. Army Rear (34)	0% (0)	35% (12)	6% (2)	0% (0)
505 Main St- Rear (13)	0% (0)	<b>92% (12)</b>	77% (10)	0% (0)
567 Main St- Roller Rink Parking (32)	3% (1)	56% (18)	19% (6)	13% (4)
119 Washington St- Kidcity Rear (105)	0% (0)	61% (64)	56% (59)	2% (2)
363 Main St- Library/Pedal Power (47)	0% (0)	47% (22)	83% (39)	4% (2)
129 Wash St- Broad/Wash Corner (15)	0% (0)	<b>100% (15)</b>	40% (6)	0% (0)
210 Court St- Corner Court/Broad (54)	0% (0)	70% (38)	6% (3)	0% (0)
315 Main St- Liberty Bank (N) Rear (25)	4% (1)	44% (11)	20% (5)	4% (1)
Street- Court (N) (12)	0% (0)	67% (8)	67% (8)	25% (3)
118 Court St- Middlesex Mutual (1074)	4% (44)	77% (827)	6% (60)	0% (0)
255 Main St- Citizens/Bank of Amer (27)	0% (0)	41% (11)	52% (14)	0% (0)
271 Main St- Bank of Amer/Liberty (18)	0% (0)	56% (10)	61% (11)	6% (1)
Street- Court St (S) (12)	0% (0)	75% (9)	58% (7)	0% (0)

70 Broad St- SNET Upper lot (33)	9% (3)	36% (12)	9% (3)	9% (3)
70 Broad St- SNET Lower lot (30)	0% (0)	7% (2)	0% (0)	0% (0)
College Street- Middlesex Plaza (1140)	3% (3)	<b>95% (108)</b>	47% (54)	6% (7)
Street- Old Church St (28)	32% (9)	<b>118% (33)</b>	57% (16)	21% (6)
45 Broad Street- Broad St Books (53)	21% (11)	45% (24)	28% (15)	25% (13)

Table 10- Locations that average near or above full capacity of 85%- weekday

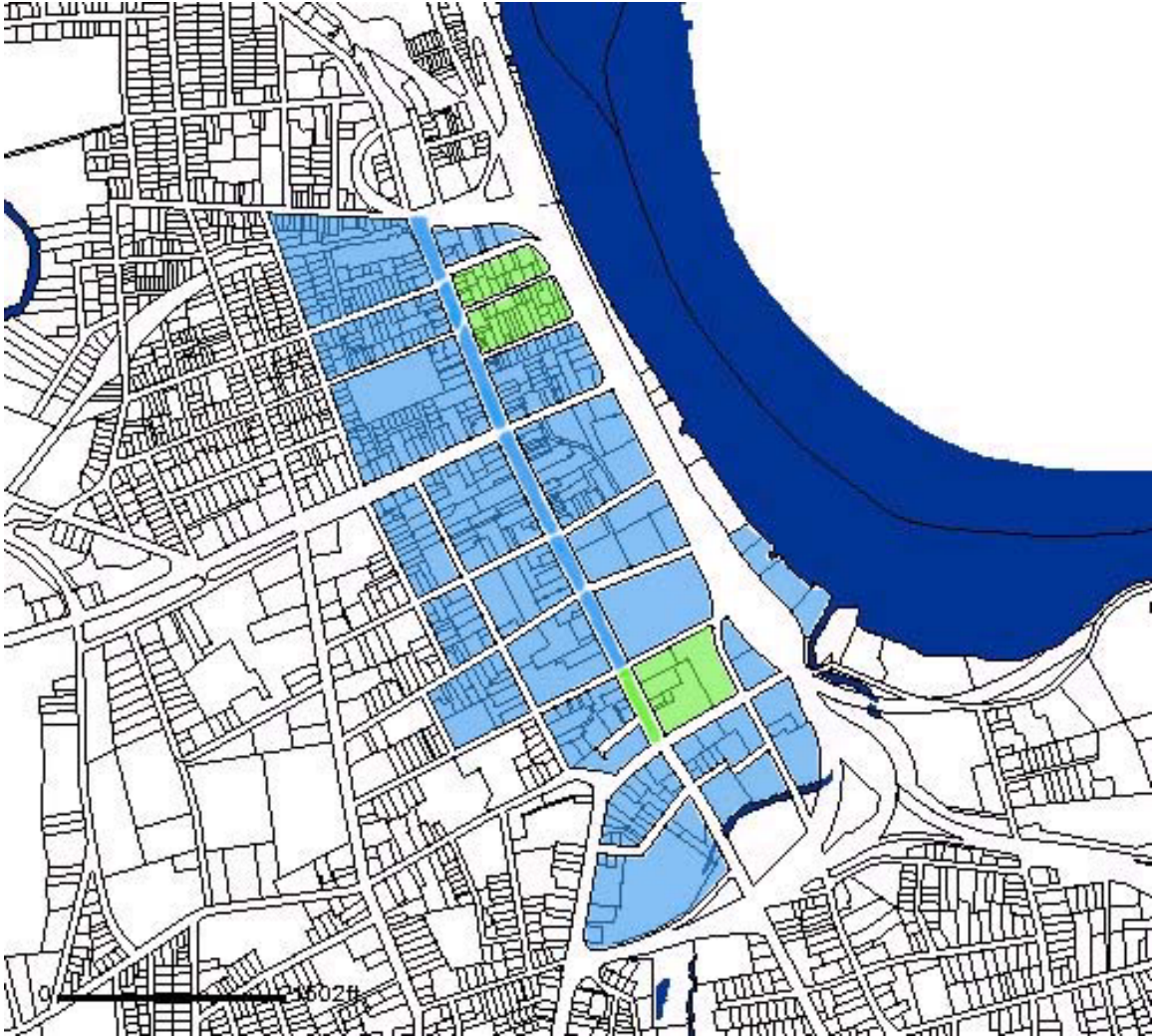
Rank	Location	Neighborhood	Average occupancy %
1	584 Main Street- Shliens Rear/Alleyway	North End	100%
2	Main Street- East side MLK/Union	South End	95%
3	Main Street- West side Williams/Old Church	South End	83%
4	40 Broad Street- Sbona Tower	Central Core	81%
5	15 Pleasant Street- Boarding House Rear	South End	78%
6	Ferry Street- South side	North End	75%
7	Main Street- East side Rapallo/Hartford	North End	72%
8	20 Main Street- Inn at Middletown Rear	South End	70%

Table 11- Locations that average below 10% capacity- weekday

Rank	Location	Neighborhood	Average occupancy %
1	Harbor Drive- Gravel Lot	Riverfront	1%
2	70 Broad St- SNET Lower Lot	Central Core	2%
3	130 Main St- Metro Sq- Rear	Central Core	3%
	Dekoven Dr- Wash/Court	Central Core	3%
	44 Wash. St- Diana Salon	North End	3%
	56 Hamlin St- Parking Lot	Central Core	3%
4	Harbor Park- Middle	Riverfront	7%
5	30 Dekoven Dr- Rental Ctr	South End	8%
	Harbor Park- South	Riverfront	8%



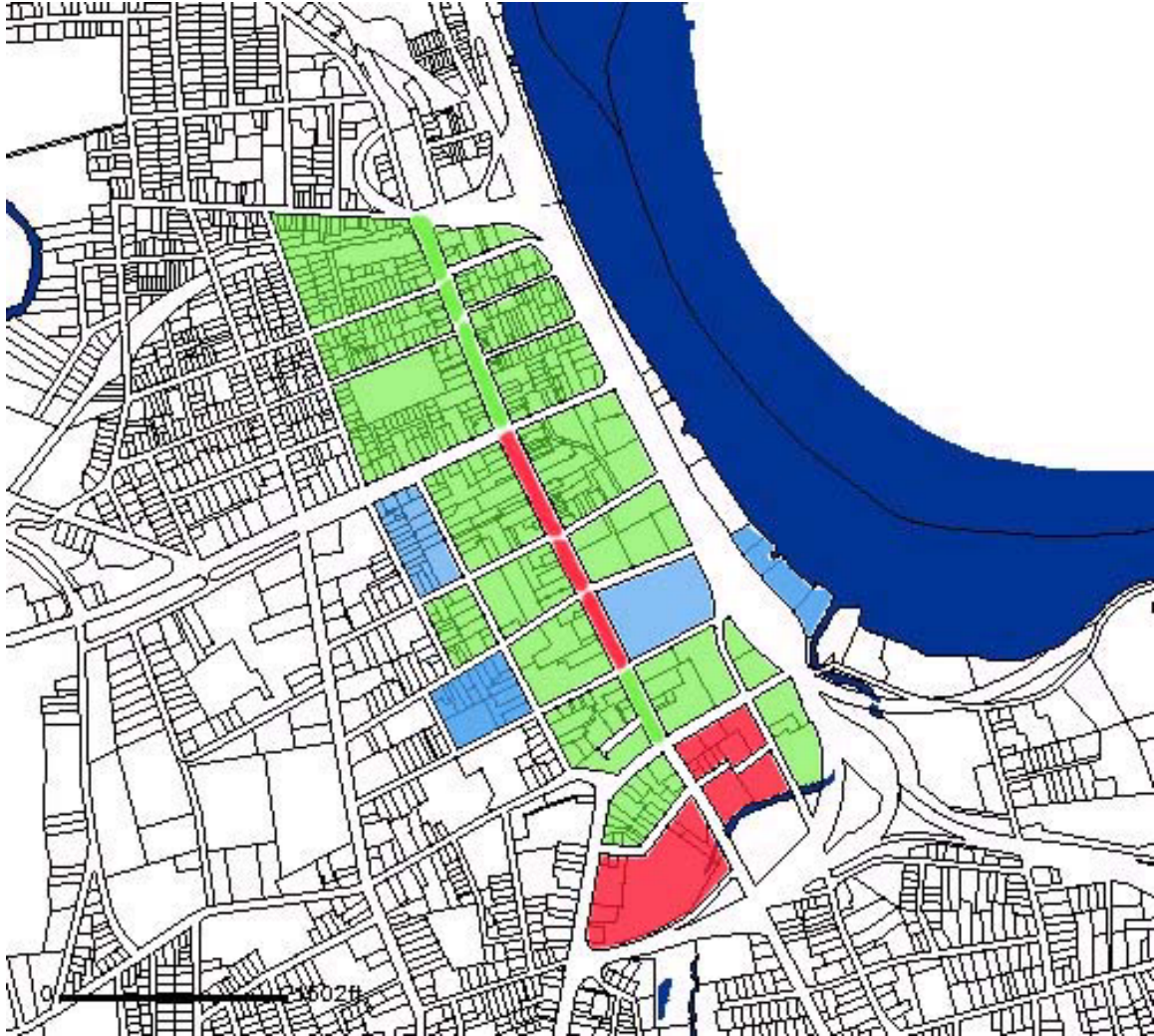
Map 1- Weekday 5am-7am



Blue- 0% - 39% Occupancy  
Green- 40%- 85% Occupancy  
Red- 85%-100% Occupancy

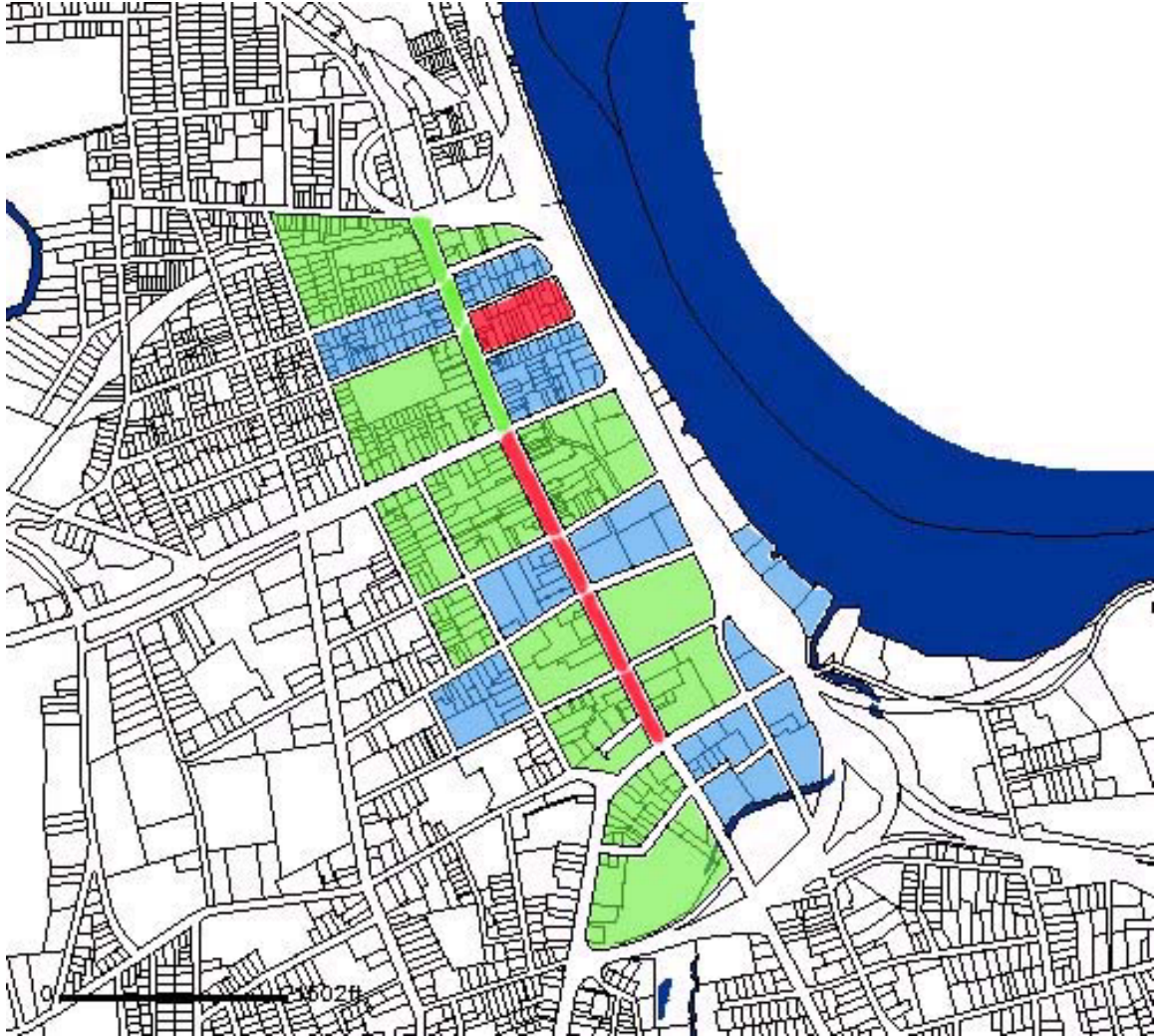


Map 2- Weekday 11am-1pm



Blue- 0% - 39% Occupancy  
Green- 40%- 85% Occupancy  
Red- 85%-100% Occupancy

Map 3- Weekday 6pm-8pm



Blue- 0% - 39% Occupancy  
Green- 40%- 85% Occupancy  
Red- 85%-100% Occupancy



Map 4- Weekday 10pm-12pm



Blue- 0% - 39% Occupancy  
Green- 40%- 85% Occupancy  
Red- 85%-100% Occupancy

### Weekend Parking Usage

During the weekend, parking demand as an aggregate is less than the weekday demand. The major reason for this is that a number of office related parking facilities, most notably the Middlesex Mutual Building and the Middlesex Court House are closed, and the hospital sees only a third of its weekday occupancy. These facilities equal nearly 50% of downtown parking. The peak period is in the early evening. Street parking is in higher demand than off-street parking. Main Street parking spaces experiences its highest demand of the week during the weekend with only 6 parking spaces available.

Table 12- Downtown Parking Demand Cycles- weekend

Location	5am-7pm	11am-1pm	6pm-8pm	10pm-12pm
Downtown Parking (6581)	12% (822)	29% (1932)	32% (2096)	20% (1325)
On-Street Parking (754)	27% (203)	56% (421)	58% (439)	42% (318)
Off-Street Parking (5827)	11% (619)	26% (1511)	28% (1657)	17% (1007)
Public Parking (2706)	13% (347)	34% (910)	32% (868)	20% (554)
Private Parking (3875)	12% (475)	28% (1070)	32% (1228)	20% (771)
Restricted/Pay Parking (1976)	1% (18)	15% (303)	13% (251)	4% (80)
Free Parking Off-Street (3851)	16% (601)	31% (1208)	37% (1406)	24% (927)
Main Street Parking (283)	21% (60)	83% (236)	<b>98% (277)</b>	58% (163)

Figure 5- Weekend Downtown Parking Demand Cycles

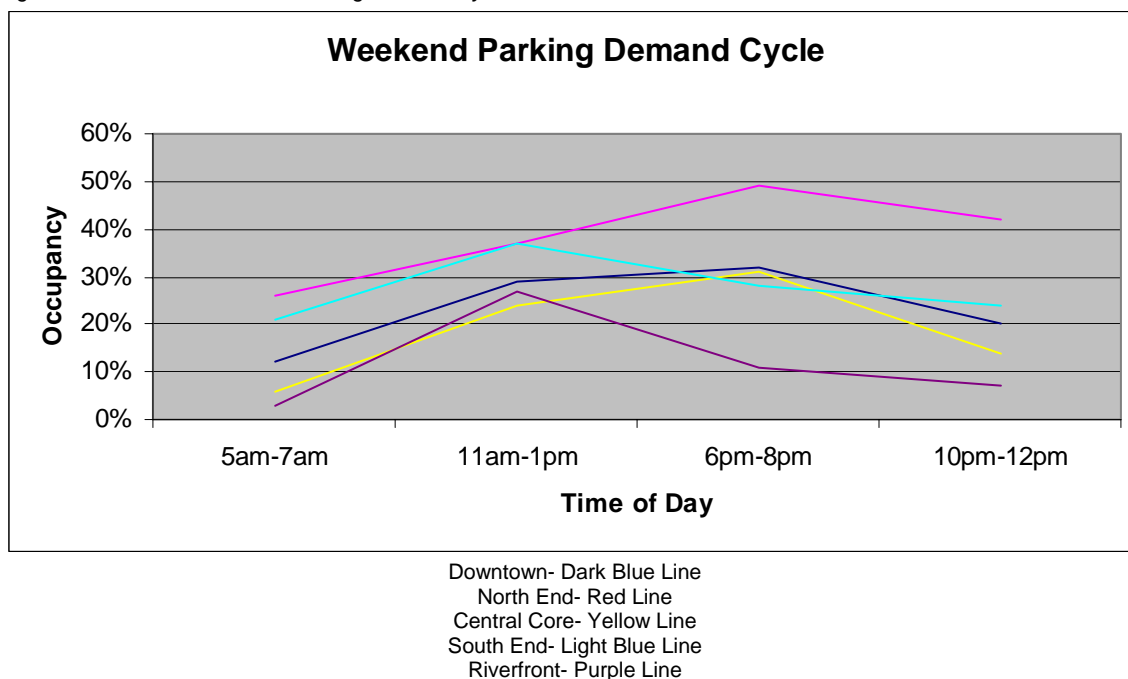
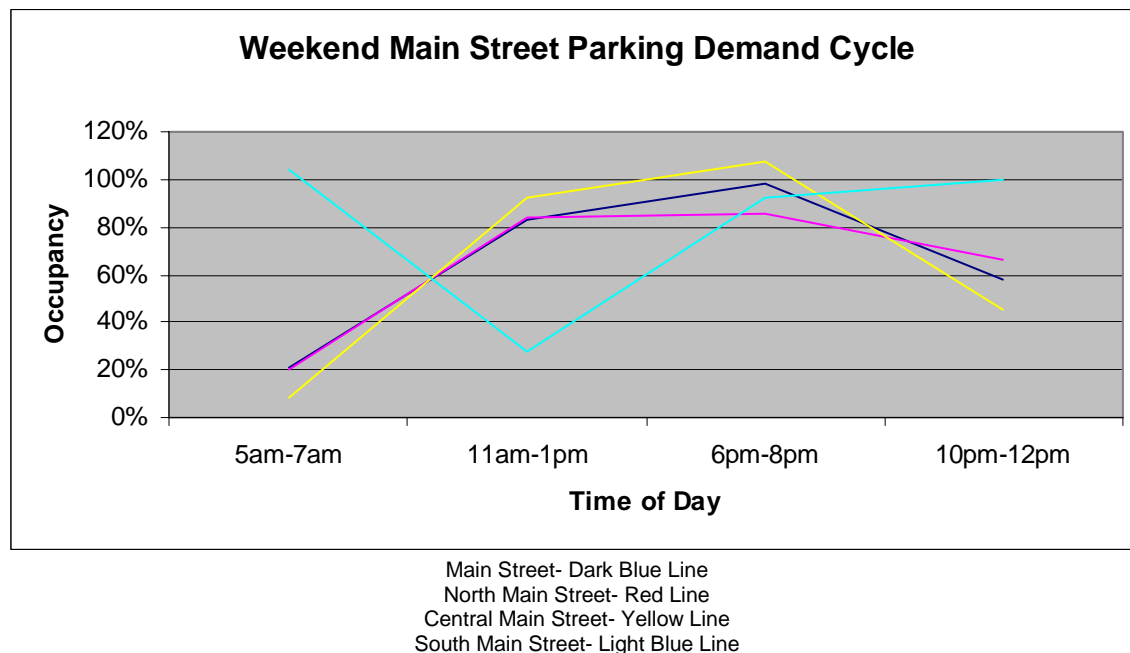


Figure 6- Week Main Street Parking Demand Cycles



The North End neighborhood of downtown experiences the similarly constant level of demand through out the weekday, but with greater demand on Main Street. The early evening is the peak period, but demand continues to remain strong until late night, due to increasing number of restaurants and bars that stay open late, and residential parking needs.

Table 13- North End Parking Demand Cycles- weekend

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
North End Parking (729)	26% (188)	37% (270)	49% (354)	42% (308)
NE On-Street Parking (241)	38% (92)	60% (145)	63% (153)	59% (142)
NE Off-Street Parking (488)	20% (96)	26% (125)	41% (201)	34% (166)
NE Public Parking (407)	35% (144)	51% (206)	58% (238)	55% (224)
NE Private Parking (322)	14% (44)	20% (64)	36% (116)	26% (84)
NE Main Street Parking (104)	20% (21)	84% (87)	<b>86% (89)</b>	66% (69)

The Central Core weekend parking cycle experiences very little demand for office related off street parking. Off Street Parking that serves restaurant, retail and entertainment facilities see higher demand in the early and late evening than during the week. Early evening is the peak period. Main Street is well above full capacity throughout the midday and early evening, and at nearly triple the weekday level in the late evening.

Table 14- Central Core Parking Demand Cycles- weekend

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
Central Core Parking (3804)	6% (204)	24% (914)	31% (1198)	14% (549)
CC On-Street Parking (297)	14% (42)	67% (200)	77% (230)	35% (104)
CC Off-Street Parking (3507)	6% (198)	20% (714)	28% (968)	13% (445)
CC Public Parking (1904)	7% (135)	31% (594)	29% (560)	13% (251)
CC Private Parking (1900)	6% (111)	20% (382)	34% (643)	16% (304)
CC Main Street Parking (154)	8% (13)	<b>92% (142)</b>	<b>107% (165)</b>	45% (69)
CC Street- Excl. Main (143)	20% (29)	41% (58)	45% (65)	24% (35)

The South End's weekend parking demand is almost entirely caused by clients of the Inn at Middletown. The Hospital's demand is less than half of the weekday demand. The Inn at Middletown's clients take advantage of the Main Street parking section of the South End with demand well exceeding full capacity, even into the early morning and late night time periods.

Table 15- South End Parking Demand Cycles- weekend

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
South End Parking (1869)	21% (389)	37% (700)	28% (525)	24% (455)
SE On-Street Parking (216)	32% (69)	35% (76)	26% (56)	33% (72)
SE Off-Street Parking (1653)	19% (320)	38% (624)	28% (469)	23% (383)
SE Public Parking (216)	32% (69)	35% (76)	26% (56)	33% (72)
SE Private Parking (1653)	19% (320)	38% (624)	28% (469)	23% (383)
SE Main Street Parking (25)	<b>104% (26)</b>	28% (7)	<b>92% (23)</b>	<b>100% (25)</b>

The Riverfront has little parking demand during the weekend, with the peak period around midday, as a result of visitors to the Boat houses.

*Table 16- Riverfront Parking Demand Cycles- weekend*

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
Riverfront Parking (179)	3% (5)	27% (48)	11% (19)	7% (13)
RF On-Street Parking (0)				
RF Off-Street Parking (179)	3% (5)	27% (48)	11% (19)	7% (13)
RF Public Parking (179)	3% (5)	27% (48)	11% (19)	7% (13)
RF Private Parking (0)				

Main Street sees even heavier demand during the weekend than during the week, with 14 of 15 sections reaching full capacity at least once during the day. The sections of Main Street near the Inn at Middletown are the only locations in the City at full capacity in the early morning hours.

*Table 17- Main Street Parking Demand Cycles- weekend*

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
Main Street (E)- Union/MLK (10)	<b>110% (11)</b>	50% (5)	<b>90% (9)</b>	<b>100% (10)</b>
Main Street (E)- MLK/Dingwall (29)	21% (6)	76% (22)	<b>110% (32)</b>	24% (7)
Main Street (E)- Dingwall/Court (14)	0% (0)	<b>121% (17)</b>	<b>114% (16)</b>	<b>100% (14)</b>
Main Street (E)- Court/Wash (37)	8% (3)	<b>105% (39)</b>	<b>111% (41)</b>	68% (25)
Main Street (E)- Wash/Ferry (24)	38% (9)	<b>96% (23)</b>	<b>108% (26)</b>	<b>88% (21)</b>
Main Street (E)- Ferry/Green (15)	7% (1)	67% (10)	<b>100% (15)</b>	67% (10)
Main Street (E)- Green/Rapallo (10)	10% (1)	<b>90% (9)</b>	<b>90% (9)</b>	30% (3)
Main Street (E)- Rapallo/Hartford (11)	55% (6)	<b>100% (11)</b>	55% (6)	36% (4)
Main Street (W)- Spring/Grand (12)	0% (0)	75% (9)	<b>92% (11)</b>	<b>100% (12)</b>
Main Street (W)- Grand/Liberty (11)	0% (0)	55% (6)	27% (3)	9% (1)
Main Street (W)- Liberty/Wash (21)	19% (4)	<b>90% (19)</b>	<b>90% (19)</b>	<b>86% (18)</b>
Main Street (W)- Wash/Court (37)	3% (1)	<b>100% (37)</b>	<b>103% (38)</b>	38% (14)
Main Street (W)- Court/College (10)	0% (0)	80% (8)	<b>90% (9)</b>	50% (5)
Main Street (W)- College/William (27)	11% (3)	70% (19)	<b>107% (29)</b>	15% (4)
Main Street (W)- William/Church (15)	<b>100% (15)</b>	13% (2)	<b>93% (14)</b>	<b>100% (15)</b>

Again as noted above, aggregating the parking by block, allows you to see how parking demand is affected at the City block level because of uses that exist in close proximity. Unlike the Weekday, there is not City Block that reaches full capacity. Table 20 lists the city blocks that have the highest average parking occupancy during the entire day, and Table 21 list the city blocks with the lowest average parking occupancy during the day.

*Table 18- City Blocks Parking Demand Cycles- weekend*

Location	5am-7pm	11am-1pm	6-pm-8pm	10pm-12pm
Block # 24 23-42 Hospital (682)	14% (96)	45% (309)	34% (229)	21% (145)
Block # 24 23-39 Sterling (180)	19% (35)	30% (54)	19% (34)	31% (56)
Block # 34 24-9 YMCA (317)	7% (23)	26% (82)	9% (28)	7% (23)
Block # 34 24-5 Personal Auto (69)	26% (18)	39% (27)	29% (20)	29% (20)
Block # 34 24-1 Mdtwn Plate Glass (73)	0% (0)	19% (14)	0% (0)	0% (0)
Block # 24 23-25 Inn at Mdtwn (344)	48% (164)	42% (144)	47% (162)	47% (162)
Block # 24 17-56 Metro Square (380)	7% (25)	32% (122)	83% (315)	37% (140)
Block # 22 17-53 Court House (863)	9% (81)	17% (145)	21% (180)	12% (106)
Block # 22 17-52 City Hall (433)	5% (21)	44% (192)	46% (201)	22% (97)
Block # 22 17-47 La Boca (163)	17% (27)	33% (53)	47% (77)	39% (64)
Block # 22 17-37 Green St Arts Ctr (49)	45% (22)	55% (27)	73% (36)	63% (31)
Block # 22 17-36 Artist Coop (102)	48% (49)	44% (45)	46% (47)	48% (49)
Block # 22 17-29 O'Rourke's (51)	43% (22)	53% (27)	43% (22)	49% (25)
Block # 22 17-28 Eli Cannon's (114)	27% (31)	36% (41)	61% (70)	64% (73)
Block # 22 17-35 CHC (68)	18% (12)	21% (14)	13% (9)	15% (10)
Block # 22 17-46 Fire House (182)	14% (25)	35% (63)	51% (93)	31% (56)
Block # 22 17-51 Kidcity (397)	3% (11)	55% (217)	36% (142)	8% (31)
Block # 22 17-55 Mdlsex Mutual (1164)	0% (1)	7% (85)	6% (71)	2% (25)
Block # 24 23-30 Mdlsex Plaza (266)	20% (52)	33% (89)	66% (175)	35% (94)
Block # 24 23-34 Doolittle Funeral (204)	26% (53)	34% (70)	25% (52)	24% (49)
Block # 24 23-29 Broad St Books (186)	23% (42)	22% (41)	19% (35)	26% (48)
Block # 24 23-27 Gianni's Pizza (20)	35% (7)	35% (7)	50% (10)	30% (6)
Block # 22 17-50 Russell Library (95)	0% (0)	17% (16)	73% (69)	2% (2)
Block # 33 24-3 Harbor Park (179)	3% (5)	27% (48)	11% (19)	7% (13)

Table 19- City Blocks with the heaviest parking demand- weekend

Rank	Location	Neighborhood	Average occupancy %
1	Block# 22 17-37- Ferry/Green Block	North End	59%
2	Block# 22 17-37- Green/Rapallo Block	North End	47%
	Block# 22 17-29 - Rapallo/Hartford Block	North End	47%
	Block# 22 17-28 - Grand/Spring Block	North End	47%
3	Block# 24 23-25 - Union/MLK Block	South End	46%
4	Block# 24 23-34 - MLK/Dingwall Block	South End	40%
5	Block# 24 23-30 - College/William Block	Central Core	39%

Table 20- Selected Locations Around Downtown Parking Demand Cycles- weekend

Location	5am-7pm	11am-1pm	6pm-8pm	10pm-12pm
80 South Main Parking Lot (98)	4% (4)	40% (39)	10% (10)	7% (7)
28 Crescent St- Hospital Parking (250)	6% (16)	50% (126)	42% (106)	14% (34)
28 Crescent St- Hospital Garage (298)	24% (73)	48% (142)	38% (112)	35% (103)
Street- South Main Street (E) (6)	0% (0)	0% (0)	0% (0)	0% (0)
Street- Main St Ext. (W) (30)	10% (3)	7% (2)	3% (1)	3% (1)
Street- Crescent St (N) (22)	50% (11)	68% (15)	32% (7)	59% (13)
Street- Crescent St (S) (5)	20% (1)	40% (2)	20% (1)	20% (1)
Street- South Main St (W) (13)	0% (0)	0% (0)	15% (2)	69% (9)
55 DeKoven Drive- YMCA (104)	13% (13)	48% (50)	13% (14)	13% (14)
1 James Moses Ave- YMCA-E2 (134)	1% (1)	1% (2)	0% (0)	0% (0)
Street- Main St Ext (E) (22)	0% (0)	14% (3)	0% (0)	0% (0)
Street- Union St (18)	11% (2)	67% (12)	6% (1)	0% (0)
100 Main St- Brooks- MLK (19)	0% (0)	0% (0)	28% (5)	11% (2)
Middletown Press Rear (105)	24% (25)	34% (36)	36% (38)	15% (16)
111 DeKoven Dr- Rivers Edge (144)	71% (102)	56% (80)	56% (80)	63% (91)
Street- Union St (N) (20)	55% (11)	55% (11)	15% (3)	45% (9)
130 Main St- Metro Square (295)	6% (19)	33% (98)	<b>90% (266)</b>	43% (127)
Court Street- Arcade Upper level (177)	0% (0)	14% (24)	41% (72)	10% (17)
Dingwall Dr- Arcade Lower level (189)	15% (29)	24% (46)	26% (49)	17% (32)
1 Court Street- Court House (365)	0% (0)	0% (0)	0% (0)	0% (0)
245 DeKoven Dr- City Hall Rear (22)	0% (0)	18% (4)	14% (3)	0% (0)
245 DeKoven Dr- City Hall Emp. (87)	0% (0)	0% (0)	0% (0)	0% (0)
Melilli Plaza (176)	9% (15)	61% (107)	68% (119)	31% (54)
74 Court St- Sons of Italy (27)	0% (0)	74% (20)	<b>96% (26)</b>	37% (10)
27 Washington St- DeKoven House (21)	14% (3)	10% (2)	19% (4)	14% (3)
512 Main St- La Boca Rear (50)	0% (0)	12% (6)	62% (31)	58% (29)
Street- Ferry Street (S) (18)	78% (14)	<b>89% (16)</b>	83% (15)	67% (12)
51 Main St- Green St Arts Ctr (18)	44% (8)	39% (7)	50% (9)	50% (9)
60 Green Street- Artist Coop Rear (39)	56% (22)	44% (17)	44% (17)	49% (19)
47 Rapallo Ave- Vacant Lot (22)	59% (13)	50% (11)	64% (14)	77% (17)
Street- Rapallo Ave (S) (14)	50% (7)	36% (5)	36% (5)	57% (8)
Street- Green St (N) (17)	35% (6)	18% (3)	12% (2)	12% (2)
Street- Rapallo Ave (N) (8)	75% (6)	75% (6)	<b>100% (8)</b>	<b>138% (11)</b>
675 Main St- Eli Cannon's Parking (55)	11% (6)	20% (11)	58% (32)	56% (31)
Street- Spring St (N) (11)	82% (9)	55% (6)	45% (5)	64% (7)
Street- Spring St (S) (18)	56% (10)	44% (8)	78% (14)	72% (13)
Street- Grand (N) (18)	33% (6)	39% (7)	44% (8)	56% (10)
631 Main St- CHC Parking (28)	0% (0)	7% (2)	0% (0)	0% (0)
Street- Liberty Street (N) (29)	41% (12)	21% (6)	21% (6)	31% (9)
465 Main Street- Luce Parking (51)	6% (3)	33% (17)	<b>90% (46)</b>	37% (19)
515 Main Street- Sal. Army Rear (34)	0% (0)	3% (1)	0% (0)	0% (0)
505 Main St- Rear (13)	0% (0)	8% (1)	0% (0)	0% (0)
567 Main St- Roller Rink Parking (32)	9% (3)	47% (15)	41% (13)	19% (6)
119 Washington St- Kidcity Rear (105)	0% (0)	70% (73)	12% (13)	3% (3)
363 Main St- Library/Pedal Power (47)	0% (0)	77% (36)	72% (34)	0% (0)
129 Wash St- Broad/Wash Corner (15)	0% (0)	0% (0)	33% (5)	7% (1)
210 Court St- Corner Court/Broad (54)	0% (0)	11% (6)	0% (0)	0% (0)
315 Main St- Liberty Bank (N) Rear (25)	8% (2)	12% (3)	84% (21)	8% (2)
Street- Court (N) (12)	0% (0)	<b>133% (16)</b>	<b>100% (12)</b>	38% (14)
118 Court St- Middlesex Mutual (1074)	0% (0)	4% (48)	0% (0)	0% (0)
255 Main St- Citizens/Bank of Amer (27)	0% (0)	33% (9)	<b>96% (26)</b>	52% (14)
271 Main St- Bank of Amer/Liberty (18)	6% (1)	33% (6)	56% (10)	17% (3)
Street- Court St (S) (12)	0% (0)	42% (5)	<b>125% (15)</b>	0% (0)
70 Broad St- SNET Upper lot (33)	18% (6)	18% (6)	18% (6)	18% (6)
70 Broad St- SNET Lower lot (30)	0% (0)	3% (1)	0% (0)	0% (0)
College Street- Middlesex Plaza (114)	4% (5)	29% (33)	<b>89% (101)</b>	43% (49)
Street- Old Church St (28)	46% (13)	39% (11)	46% (13)	32% (9)
45 Broad Street- Broad St Books (53)	26% (14)	45% (24)	15% (8)	32% (17)



Table 21- Locations that average near or above full capacity of 85%- weekend

Rank	Location	Neighborhood	Average occupancy %
1	Main Street- East Side Ferry/Wash.	North End	97%
2	Main Street- East side MLK/Union	South End	88%
3	Main Street- East side Court/Dingwell	Central Core	84%
4	Main Street- East Side Ferry/Wash.	North End	82%

Table 22- Locations that average below 5% capacity- weekend

Rank	Location	Neighborhood	Average occupancy %
1	South Main Street- East Side Hospital	South End	0%
	77 Crescent Street- Rear	South End	0%
	James Moses Avenue	South End	0%
	1 Court Street- Court House Deck	Central Core	0%
	City Hall- Employee Lot	Central Core	0%
	DeKoven Drive- West Side Court/Wash.	Central Core	0%
	Court Street- DeKoven/Main	Central Core	0%
2	1 James Moses Avenue- YMCA-E2	South End	1%
	515 Main Street- Sal. Army Parking	North End	1%
	Middlesex Mutual Deck	Central Core	1%
	70 Broad Street- SNET Lower Lot	Central Core	1%
	14 Church Street- Doolittle Funeral Home	South End	1%
	Main Street- Baptist Church Rear	South End	1%
	Main Street- Law Offices Rear	South End	1%
	Harbor Park Drive- Gravel Lot	Riverfront	1%
3	100 DeKoven Drive- Beautiful Baths	Central Core	2%
	631 Main Street- CHC Parking	North End	2%
	505 Main Street- Rear	North End	2%
4	21 Pleasant Street- Rear	South End	3%
	Main Street Ext.- East Side Hospital	South End	3%
	30 DeKoven Drive- Rental Center	South End	3%
	44 Wash. Street- Diana Salon	North End	3%

Map 5- Weekend 5am-7am



Blue- 0% - 39% Occupancy  
Green- 40%- 85% Occupancy  
Red- 85%-100% Occupancy

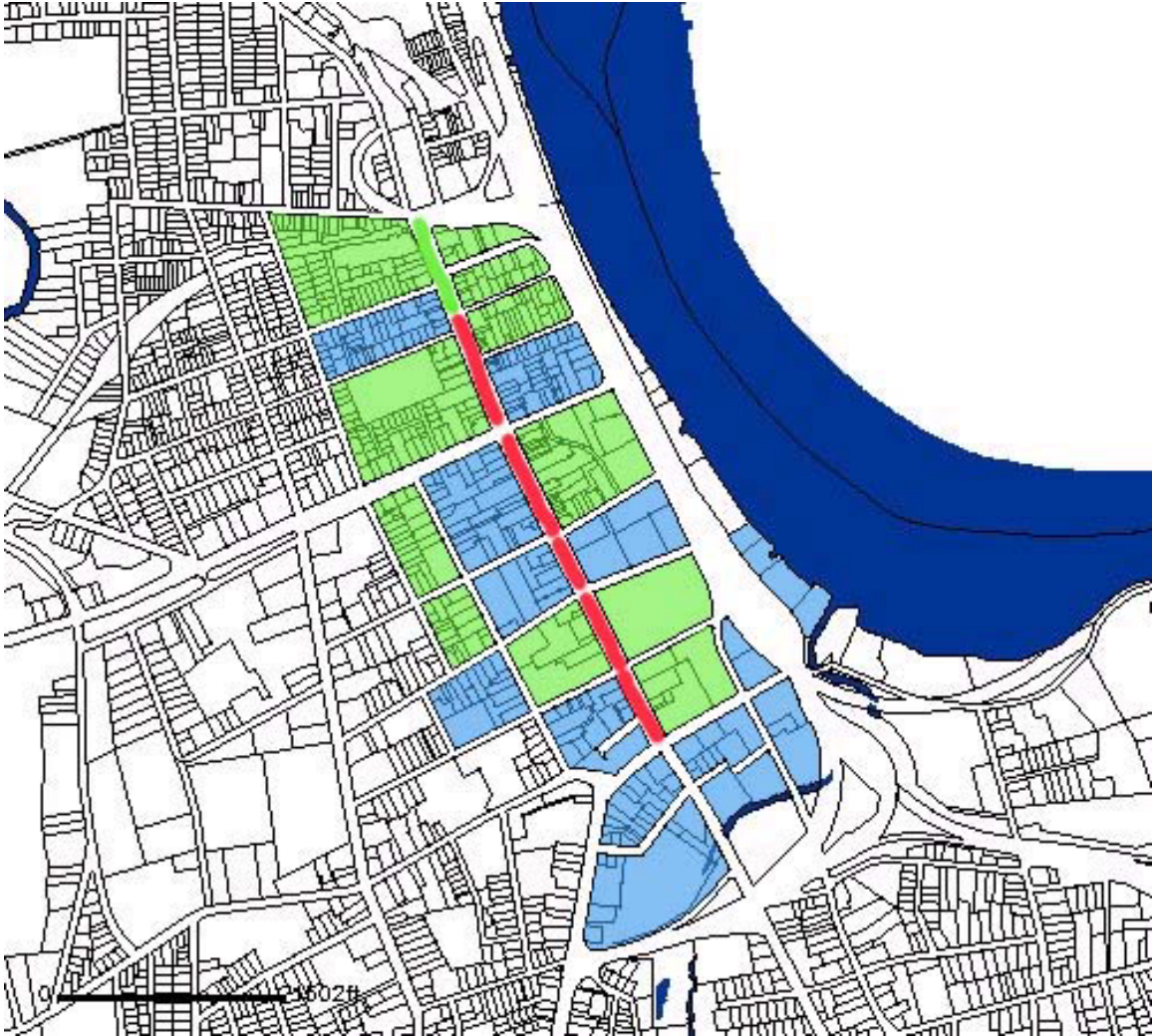
Map 6- Weekend 11am-1pm



Blue- 0% - 39% Occupancy  
Green- 40%- 85% Occupancy  
Red- 85%-100% Occupancy



Map 7- Weekend 6pm-8pm



Blue- 0% - 39% Occupancy  
Green- 40%- 85% Occupancy  
Red- 85%-100% Occupancy

Map 8- Weekend 10pm-12pm



Blue- 0% - 39% Occupancy  
Green- 40%- 85% Occupancy  
Red- 85%-100% Occupancy

### **Land Use & Off-Street Parking Requirements Analysis**

In 2005, UNCONN conducted a parking study called Parking at Mixed-Use Centers in Small Cities. The goal of this study as stated in the abstract is as follows:

"The goal of this project is to better understand parking and parking provision as it relates to smaller cities and towns with mixed-use centers. Specifically, we wanted to address how having dense, walkable, mixed-use center affects parking supply and demand, and how mixed-use centers compare to centers designed along more conventional lines. We tested these questions by conducting case study assessment of six sites in New England. Three of the sites were designated study sites because they were dense, walkable, mixed-use centers. They were contrasted with three control sites that were centers with more conventional development patterns."

The study concluded the following:

"In general, the three mixed-use study sites provided much less parking per square foot than the conventional control sites. The study sites also furnished a significant amount of on-street parking and relied more on shared municipal parking lots and parking garages. Given these differences, it is surprising to note that the towns with mixed-use centers demanded almost as much parking for new construction as did towns in which the conventional sites are located. On average, the amount of parking mandated by base regulations in these six towns is about two and a half times more than the peak use."

Table 23 shows that applying a similar methodology to examine Middletown's existing parking and land-use discovers the following.

	Parking Spaces	Square feet	% of Total Space
Total Downtown Area		4,087,196	100%
Total Building Footprint Area		1,144,252	28%
Total Off-Street Parking Footprint Area	5827	1,176,667	29%
Total Building Area		3,016,662	NA
Total Off-Street Parking Area	5827	1,446,297	NA
Required Parking Spaces	10,056	1,528,512	37%
Peak Parking Spaces	4,078	619,856	15%

By this analysis a zoning requirement of a parking space for every 300 sq. ft. of office space would require over ten thousand parking spaces in downtown Middletown. This is almost double the existing off-street parking and more than double the actual peak usage of parking in the study are. A surface lot of ten thousand parking spaces would eat up almost 40% of the land in the downtown.

Eliminating off-parking street parking requirements would allow the market to dictate how much parking is needed and perhaps allow more development than would otherwise be allowed by regulation. Requiring off-street parking for downtown developments would prevent market efficiencies from developing alternatives to building parking facilities that would take up valuable downtown land.

## Best Practices

The following practices are described in Todd Litman's book called Parking Management Best Practices.

### Strategies that increases parking facility efficiency

#### Share Parking

"Share parking" means that a parking facility serves multiple users or destinations.

##### *Shared Rather Than Reserved Spaces within a Parking Facility*

Motorists share parking spaces rather than being assigned a reserved space (a parking space that may only be used by a particular motorist). For example, 100 employees can usually share 60 to 80 parking spaces since, at any particular time, some are on leave, some are commuting by alternative mode, some are in the field, and some are working another shift. Similarly, a hotel, apartment, condominium, or dormitory can share parking spaces among residents rather than assigning spaces to each unit, since the number of vehicles per unit varies over time. Sharing can be optional. For example motorists could choose between \$60 per month for a shared space or \$100 for a reserved space.

##### *Share Parking among Destinations*

Parking can be shared among multiple destinations. For example, an office building can share parking with a restaurant or theater, since peak demand for offices occurs during weekdays and on weekend evenings for restaurants and theaters. This is most effective if diverse activities are clustered together into an activity center, mall, or campus.

##### *Public Parking Facilities*

Public parking generally serves multiple destinations. Converting from single destination to public parking allows more sharing.

##### *In-Lieu Fees and Assessments*

"In-Lieu fees" means that developers fund public parking facilities instead of private, single-destination facilities. This tends to be more cost effective and efficient because it leads to shared parking. It can be mandated or optional. Businesses can be assessed a special tax or levy to fund parking facilities in their area as an alternative to each supplying its own facilities. This is often implemented through a downtown business improvement district.

##### *Clustered Development*

Buildings and businesses can be clustered into activity centers, such as shopping malls, research campuses, and industrial parks, where parking is shared, rather than each providing its separate parking.

##### *Support of Sharing*

Parking facility sharing and trading can be supported in various ways. For example, apartment and condominium managers can maintain a list of residents who want to rent parking spaces in their buildings, and business associations can provide parking brokerage services.

##### *More Efficient Use of On Street Parking*

On-street parking spaces can be carefully managed to efficiently serve multiple destinations.

The feasibility of shared parking depends on the types of destinations, their proximity, and the quality of walking conditions between parking facilities and destinations. Some shared parking occurs naturally. For example, if a shop or restaurant is located near a large employment center, workers will often walk rather than drive for errands and meals, so parking requirements can be lower than at more isolated sites. On the other hand, some developments that claim to be mixed use may actually be too dispersed or otherwise unsuited for significant shared parking.

Sharing is most successful if destinations have different peak hours. To calculate shared parking requirements, create a weekly demand graph and stack the results.

#### Regulate Parking

Parking regulations control who, when, and how long vehicles may park at a particular location in order to prioritize facility use. This ensures that the most convenient parking spaces are available to the most important users. Many of the concepts in this chapter also apply to parking pricing, which can also prioritize use of parking spaces.

There are three general steps in developing parking regulations. First, prioritize parking facility users. Here is a typical ranking:

1. Delivery and service vehicles.
2. Vehicles used by people with disabilities.
3. Rideshare and transit vehicles.
4. Customers, tourists, and visitors.
5. Employees and residents.
6. Long-term vehicle storage.

Second, choose appropriate regulations to favor the higher-priority activities.



Third, determine how regulations will be indicated and enforced. Use signs, curb paint, maps, and brochures to denote which parking spaces are intended for which user type and how violations will be punished. In a typical commercial area, the most convenient parking spaces should be regulated for short-term use. Such spaces usually have 30- to 120-minute time limits, so each space can serve six to 12 vehicles per day. Shorter time limits increase turnover but constrain the types of activities that can be accommodated, which may frustrate customers who are unable to complete a transaction within the allowable parking period. Informal rules and encouragement can be used instead of formal regulations. For example, downtown business organizations can encourage commuters to leave more convenient parking spaces for customers. A reminder may be sent to employees who violate this policy.

#### Establish More Accurate and Flexible Standards

"More accurate and flexible standards" means that parking requirements at a particular location are adjusted to account for the following:

- Geographic, demographic, and management factors that affect parking demand and parking requirements.
- Types of trips and users, including their priority and ability to rely on alternatives.
- The cost and ease of adding parking capacity.
- The ability to implement parking management programs that reduce parking requirements.
- The availability of overflow parking supply nearby.
- The problems that result from spillover parking and the ability to address problems on other ways, such as improved user information, enforcement, or compensation.

Conventional parking standards are often excessive and applied inflexible, resulting in significantly more parking supply than is actually needed. Efficiency-based standards allow more accurate and reduced parking supply, and encourage use of other management strategies to address potential problems. Current planning practices often place a heavy planning burden of proof on reduction from conventional standards; efficiency-based planning shifts the burden of proof, so parking requirements can be reduced unless there is clear evidence that doing so will cause significant problems that cannot be addressed in other ways.

Many transportation professionals support the use of more accurate parking standards. Professional guides, such as the Institute of Transportation Engineers' Parking Generation (ITE, 2004), recommend conducting detailed analysis of parking requirements for each situation, but many jurisdictions ignore these recommendations and simply adopt generic standards applied with little flexibility.

Parking standards should be adjusted to reflect changing needs and conditions. Younger communities tend to have lower land values, densities, and traffic problems, so relatively high parking standards may be justified; however, as these communities grow and become more urbanized, the same standards become economically excessive. Parking demand at a particular location may vary over time as uses, occupants, and conditions change. Over its operating life, a building or district may experience various occupants, uses, and activities, with differing parking requirements. More flexible parking standards, coupled with parking management, allow a greater range of uses while reducing development costs.

Government-mandated parking standards may be unnecessary altogether. Eliminating minimum parking requirements does not eliminate parking supply; it simply allows developers and commercial parking operators to determine how much parking to supply based on market conditions, consumers' willingness to pay, the cost of providing parking, and the feasibility of applying management strategies. Many business districts have no parking requirements, relying on the market to supply parking. It makes sense to expand the areas with market-based parking supply as a community becomes more urbanized or wants to encourage more efficient transportation and land-use patterns.

One way to increase flexibility is allow contingency-based standards, that is, minimum parking requirements that are flexible and adjust over time based on performance indicators. Developers are allowed to provide less than the standard parking supply as long as they meet pre-established performance standards. If these indicators are exceeded, the developer is required to either supply more parking or implement a parking management program. This can be enforced with a bond or fine.

"Context-sensitive design" refers to planning and design practices that are flexible and responsive to local conditions. This means, for example, that parking requirements should be adjusted to reflect a community's geographic, demographic, and historic conditions.

"Form-based codes" refers to building codes that define the type of development desired and provide maximum flexibility for achieving it. This encourages more innovative design, including more land-use mixing, and implementation of parking management to reduce parking requirements.

"Planning overlay districts" are areas where special zoning codes and development practices apply, such as downtown or transit-oriented neighborhood. They often have reduced and more flexible parking requirements, and features that support parking management.

Parking standards can sometimes be made more accurate simply by improving analysis methods. For example, some jurisdictions apply the same parking requirements to any sized housing unit, regardless of whether it is a

small studio or a five-bedroom apartment. In that case, basing parking requirements on the number of bedrooms or floor area, and providing an alternative standard for housing with low parking demand, can reduce excessive parking requirements.

#### Establish Parking Maximums

Parking maximums place an upper limit on supply of parking allowed, either at individual sites or over an area, such as a commercial district. Area-wide limits are called “parking caps.” Maximums can apply only to certain types of parking depending on planning objectives. These can be in addition to or instead of minimum parking requirements. Excessive parking supply can also be reduced by reducing public parking supplies, imposing a special parking tax, and by enforcing regulations that limit temporary or inferior design parking facilities.

These strategies are usually implemented in large urban centers as part of integrated programs to reduce excessive parking supply, encourage use of alternative modes, support more compact development, create more attractive streetscapes, preserve historic buildings, and support other transportation and land-use planning objectives.

It could be argued that parking maximums are as unnecessary and inefficient as minimum parking requirements. As discussed earlier, one approach is to simply allow property owners to determine how much parking to supply at their sites. However, parking minimums have been applied for decades, resulting in well-established transportation and land-use market distortions that increase parking supply beyond what is economically optimal, and lead motorists to expect free parking at each destination. As a result, individual developers and businesses often find it difficult to reduce supply. Parking maximums that apply equally to all businesses in an area may be more acceptable and effective than expecting each business to reduce their parking supply. Left to itself, the market may take decades to reach an optimal level of parking supply. Parking maximums may be necessary to achieve this more quickly.

#### Provide Remote Parking and Shuttle Service

“Remote parking” (also called “overflow parking” or “satellite parking”) involves the use of off-site parking facilities. It often uses shared facilities, such as office workers parking at a restaurant parking lot during the day in exchange for restaurant employees using the office parking lot during the evening and on weekends.

Remote parking can also involve use of parking facilities at the periphery of a business district or other activity center, and use of overflow parking during special events that attract large crowds. Special shuttle buses or free transit service may be provided to allow use of more distant parking than would otherwise be acceptable. Another type of remote parking is Park & Ride facilities, located at the urban fringe, where commuters can leave their vehicles when they carpool or use public transit.

Remote parking requires adequate user information and incentives to encourage use of distant facilities. For example, signs and maps should indicate the location of peripheral parking facilities and their price should be lower than in the core.

#### Implement Smart Growth Policies

“Smart growth” is a general term for development practices that result in more compact and accessible land-use development. It is an alternative to sprawl.

Smart growth supports and is supported by parking management. Parking management reduces the amount of land required for parking facilities, allowing more compact development, and encourages use of alternative modes, such as walking, cycling, and public transit. These, in turn, tend to compact development allows additional sharing and pricing of parking facilities. Smart growth usually incorporates specific parking management strategies.

Sprawl scatters destinations, making it difficult to walk from one to another, so it is infeasible to share parking and difficult to use public transit. People who live or work in such areas tend to make many vehicle trips, requiring generous parking supply.

Smart growth allows activities to be clustered together in an area with good walking facilities and public transit services. People who live and work in this area tend to own fewer cars and drive less, and there are more opportunities to share parking facilities and apply other management strategies, thus reducing parking requirements.

#### Improve Walking and Cycling Conditions

Walking and cycling improvements support parking management strategies in several ways:

- Improving walkability expands the range of parking facilities that serve a destination. This increases the feasibility of sharing parking facilities and use of remote parking facilities.
- Improving walkability increases park-once trips, which reduces the amount of parking required at each destination
- Walking and cycling improvements encourage transit use since most transit trips involve walking or cycling links.

-Walking and cycling improvements can help reduce total vehicle ownership and use in an area. People who live and work in more walkable and cyclable communities tend to own fewer vehicles and take fewer vehicle trips than those in more automobile-oriented locations.

Nonmotorized travel is affected by the quality of walking and cycling facilities, the distance between parking and destinations, and factors such as the speed of adjacent vehicle traffic and noise levels. Acceptable nonmotorized travel distances vary depending on the type of trip, the type of user, and conditions.

Walkability within parking facilities is also important. Pedestrian safety, comfort, and convenience should be considered in parking facility design, including marked walkways that protect pedestrians from traffic, convenient sidewalk connections, and awnings for shelter from sun and rain. Urban parking lots can serve as midblock walkways, giving pedestrians a shortcut from one street to another, which improves nonmotorized accessibility and expands the number of destinations the parking facility can serve.

#### Increase Capacity of Existing Parking Facilities

The capacity of existing parking facilities can often be increased without requiring more land or major facility construction. Here are some strategies to do this:

- Use currently wasted areas, which can be particularly appropriate for small cars and motorcycle and bicycle parking.
- Where there is adequate street width, change on-street parking orientation from parallel to angled spaces.
- Allow tandem parking and count this toward minimum parking requirements.
- Maximize the number of on-street parking spaces.
- Reduce parking space size. A portion of spaces can be sized for compact vehicles, which require about 20 percent less space than full-sized stalls. Employee and residential parking spaces can be somewhat smaller than shorter-term parking, which must accommodate more movement and loading activity.
- Provide special, small parking spaces for motorcycles. Allow and encourage motorcycles to share parking spaces when possible.
- Use car stackers and mechanical garages, which can significantly increase parking capability, although they are only suitable for certain applications. They generally require an attendant to move lower-level vehicles when needed to access upper-level vehicles, and stackers may be unable to accommodate larger vehicles, such as sport utility vehicles, vans, and trucks.
- Use valet parking.
- Remove or consolidate nonoperating vehicles, equipment, material, and junk stored in parking facilities, particularly in prime locations.

### **Strategies that Reduce Parking Demand**

#### Implement Mobility Management

"Mobility management" is a general term for strategies that increase transportation system efficiency by changing travel behavior. It can affect travel frequency, mode, destination, or timing. There are many different mobility management strategies.

Mobility management both supports and is supported by parking management. Mobility management usually reduces parking demand and many parking management strategies encourage travel changes. Some strategies, such as parking pricing and walkability improvements, are considered both parking and mobility management measures.

#### *Improved Transport Options*

- Flextime
- Bicycle improvements
- Bike/transit integration
- Carsharing
- Guaranteed ride home
- Security improvements
- Park & Ride
- Pedestrian improvements
- Ridesharing
- Shuttle services
- Improved taxi service
- Transit improvements

#### *Incentives to Shift Mode*

- Bicycle and pedestrian encouragement
- Congestion pricing
- Distance-based pricing
- Commuter financial incentives
- Fuel tax increases
- High-occupant-vehicle priority
- Pay-As-You-Drive vehicle insurance
- Parking pricing
- Road pricing
- Vehicle use restrictions

*Land-Use Management*

- Car-free districts
- Compact land use
- Location-efficient development
- New urbanism
- Smart growth
- Transit-oriented development
- Street reclaiming

*Policies and Programs*

- Access management
- Campus transport management
- Data collection and surveys
- Commute trip reduction
- Freight transport management
- Marketing programs
- School trip management
- Special event management
- Tourist transport management
- Transport market reforms

Price Parking

Pricing parking is the practice of requiring motorists to pay directly for using parking facilities. It may be implemented as a parking management strategy, as a mobility management strategy, to recover parking facility costs, or to raise revenue for any purpose. It is often intended to achieve a combination of objectives.

Currently, most parking is inefficiently priced, that is, the prices consumers pay do not accurately reflect the cost imposed by their parking decisions. Most parking is provided free, significantly subsidized, or bundled, which forces consumers to pay for parking regardless of whether or not they want it. Prices seldom vary by time or location to accurately reflect marginal costs. When parking is priced, motorists often pay a flat annual or monthly fee, providing little incentive to use alternative modes occasionally.

Of course, motorists generally prefer unpriced parking; however, the choice is not really between free and paid parking. It is between paying directly or indirectly, since consumers ultimately bear parking facility costs through rents, taxes, or wages. When parking is paid indirectly, consumers do not have this option. Efficient pricing allows higher-value trips to outbid lower-value trips for the most convenient spaces, so motorists can find a space when they really needed it. The choice, therefore, is actually between paying indirectly for inefficiently allocated parking or paying directly for efficiently allocated parking.

Pricing previously free parking is politically difficult, but there are ways to overcome this resistance. For example, rather than simply pricing parking, cash out free parking, allowing commuters to choose between subsidized parking spaces or the cash equivalent. Similarly, rather than charging extra for residential parking, offer a discount to renters who do not use a parking space. It is also possible to overcome political resistance by using revenue in ways that address objections. For example, revenues can be used to fund transportation improvements, new community services, or tax reductions.

Much of the objection to priced parking reflects users' frustration with the methods used to collect fees. Current pricing methods often require motorists to pay with a particular denomination, predict the maximum amount of time they will be parked, and purchase relatively large time blocks, such as 2 hours or a day. There is often no provision for parking for just a few minutes or for an uncertain amount of time. New pricing methods can address these problems, making pricing more convenient and fair.

Below are guidelines for more efficient parking pricing:

- Wherever possible, charge consumers directly rather than indirectly for parking.
- Use improved pricing methods that are more convenient. For example, use pricing systems that charge for just the amount of time a vehicle is parked rather than for fixed time blocks.
- Use small time units, so motorists can avoid paying for more time than they need. For short-term parking, charge by the minute rather than by the hour; for long-term parking, charge by the hour rather than by the day or month.
- Charge higher rates and use shorter pricing periods at the most convenient parking spaces to increase turnover and favor higher-priority uses. Prime spaces should generally be at least twice as expensive per unit of time as less convenient spaces. For example, in a central business district, charge \$.25 for each 15-minute period with a 2-hour limit; at the fringe, charge \$4 per day. Adjust the ratio between short- and long-term spaces as needed to optimize use.
- Use a progressive pricing structure in more convenient spaces to favor short-term users.
- Minimize discounts for long-term parking passes.
- Eliminate unlimited-use weekly, monthly, and annual passes altogether. Instead, sell books of daily tickets so commuters save money every day they avoid driving.
- Eliminate early-bird discounts, which encourage automobile commuting.
- To increase revenues, expand when and where parking is priced rather than raising rates at existing priced facilities. For example, rather than increase rates from \$1 to \$1.25 per hour where parking is already priced, maintain the current rate but price more spaces and begin charging \$.50 per hour during evening and weekends.
- Use parking payment revenues to fund transportation management associations, business improvement district, and other services that directly benefit area visitors, residents, and businesses.
- Set parking prices based on transit fares.

- Encourage or require businesses to price parking. For example, allow developers to reduce their minimum parking requirements and increase density if parking is priced.
- Tax parking spaces and encourage or require that this cost be passed on to users. Reform existing tax policies that favor free parking.
- If parking must be subsidized, use targeted discounts and exemptions. For example, allow businesses to validate customer parking and provide direct discounts to people with disabilities rather than provide free parking to everybody.
- If parking must be subsidized, offer comparable benefits for use of other travel modes, such as cash-out payments or transit subsidies.
- Unbundle parking so people who rent or purchase building space can choose how much parking is included.
- Lease on-street parking spaces. For example, let residents and businesses lease the parking spaces in front of their homes or shops, which they could use themselves, reserve for their visitors and customers, or rent to other motorists.
- Provide free or discounted parking to rideshare vehicles.

#### Improve Pricing Methods

Much of the resistance to parking pricing results from inconvenient pricing methods:

- Many systems require payment in specific denominations.
- Many systems require motorists to predict how long they will be parked, with no refund available if they leave earlier than predicted.
- Some payment systems cannot easily handle discounts or variable rates.
- Some systems are confusing or time consuming to use.
- Some systems have high equipment or enforcement costs.
- Enforcement often seems arbitrary or excessive.

Better payment methods are available. Newer electronic systems are more convenient, accurate, flexible, and cost effective. They can accommodate various payment methods, charge only for the amount of time parked, incorporate variable rates and discounts, automatically calculate rates for specific times, and are convenient to use. Some can be integrated with payment systems for other public services, such as transit, road tools, and telephone use. Some employ contactless technology, which automatically deducts payment. Newer systems produce printed receipts and record data for auditing, which prevents fraud and increases convenience for customers, operators, and local governments. They can also automatically record data on utilization and turnover, which improves planning and administration.

Alternatively, pricing can be more convenient and secure with parking facility attendants. Some parking facilities use attendants during peak periods and rely on mechanical or electronic payment during off-peak periods. Better equipment maintenance and more courteous enforcement can also improve pricing.

#### Provide Financial Incentives

Financial incentives provide travelers, particularly commuters, with financial rewards for reducing their vehicle trips or shifting to cheaper parking facilities. These rewards reflect the resulting cost savings. There are various types of incentives:

- Parking cash-out (commuters can choose cash instead of a parking subsidy).
- Transit benefits (commuters can choose a subsidized transit pass instead of a parking subsidy).
- Universal transit passes (a group purchases discounted transit passes for all members, such as all students at a college or all employees at a worksite).
- Discounted or preferential parking for rideshare (carpool and vanpool) vehicles.

#### Unbundle Parking

"Unbundle parking" means that parking spaces are rented and sold separately from building space so occupants only pay for the parking they actually want to use. For example, rather than renting an apartment with two "free" parking spaces for \$1,000 per month, the apartment could rent for \$800 per month plus \$100 per month for each parking space the renter chooses. This is more equitable and efficient since it allows consumers to choose how much parking to purchase based on their individual requirements.

Parking can be unbundled in several ways:

- Facility managers can unbundle parking when renting building space.
- Developers can make some or all parking optional when selling buildings. For example, a condominium could sell with just one space, with additional spaces available for rent.
- In some cases, it may be easier to offer a discount or rebate to renters who use fewer than average parking spaces. For example, an office or apartment might rent for \$1,000 per month with two "free" parking spaces, but renters who only use one space receive a \$75 monthly discount.
- Minimum parking requirements can be reduced for developments with unbundled parking in recognition that it tends to reduce parking demand.
- Informal unbundling can be encouraged by helping to create a secondary market for available spaces. For example, office, apartment, and condominium managers can maintain a list of residents who have excess parking spaces that are available for rent, and parking brokerage can help lease, rent, and trade parking supply between buildings.

### Reform Parking Taxes

Parking tax reform includes various changes to current tax policy to support parking management. Major categories of parking tax reforms are described below:

#### *Commercial Parking Taxes*

"Commercial Parking Taxes," which are special taxes on user-paid parking transactions, are fairly common and relatively easy to implement, but they tend to discourage parking pricing since they make free parking relatively more valuable to motorists and are considered unfair since they are borne primarily in urban centers where parking is priced.

#### *Per-Space Levies*

"Per-space levies" are special taxes imposed on parking facilities, such as a \$30 annual tax on each nonresidential parking space. If applied specifically to employee parking, it is called a "workplace parking levy." This is more difficult to implement than a commercial parking tax since it requires an inventory of all qualified parking spaces, but it tends to be more efficient and fair since it applies to more types of parking, not just commercial parking.

#### *Free Parking Levies*

"Free parking levies" are special taxes imposed on unpriced parking, such as a \$50 annual tax per space provided free to employees. They are a variation on per-space levies designed to discourage unpriced parking.

#### *Stormwater Management Fees*

"Stormwater management fees" are utility fees based on a property's impervious surface area to fund stormwater management services, such as a \$15 annual fee per 1,000 square feet of pavement or a \$5 annual fee per parking space.

#### *Car-Free Tax Discounts*

"Car-free tax discounts" are property tax discounts provided to households that do not own an automobile, reflecting the lower roadway and traffic service costs that they impose. For example, if municipal roadway maintenance and traffic service costs average \$200 annually per vehicle owned in the community, a tax discount up to this amount could be provided to households that do not own a car.

#### *Parking Facility Assessment Reforms*

"Parking facility assessment reforms" means that property tax assessments value land devoted to parking facilities at the same rate as adjacent land used for other purposes. With current practices, land used for unpriced parking is often given a low assessment value since it does not directly earn a profit. Charging a higher rate encourages property owners to devote less land to parking.

#### *Income Tax Policy Reforms*

"Income tax policy reforms" means that employee parking subsidies are treated as a taxable benefit, employee parking tax exemptions are limited, or tax exemptions are provided to subsidies of other modes, such as employer-provided transit passes. Current tax policies make parking subsidies an attractive benefit. A typical employee must earn \$1,500 or more in pretax income to pay for a parking space that costs their employer only \$1,000 to provide. U.S. tax policy makes transit benefits income tax exempt, but other countries have yet to implement such reforms, and many employers are unaware of these options or have yet to offer them to employees.

#### *Smart Growth Tax and Pricing Reforms*

Several tax and pricing reforms can encourage compact development and discourage sprawl. For example, development fees, utility rates, and tax rates can reflect the higher costs of providing public services to more dispersed locations, creating additional financial incentives for more compact, infill development. Tax discounts can reward businesses that choose more accessible locations.

These tax reforms may be justified on several grounds. If governments must tax something, parking facilities and activities can be particularly appropriate because doing so helps achieve parking and transportation management objectives in addition to raising revenue, providing what economists call a "double dividend". Parking taxes encourage property owners to reduce parking supply and implement more parking management strategies. Special parking taxes and car-free discounts can be considered a road-user fee: They provide incentives to reduce vehicle ownership and use and therefore traffic problems. Parking tax revenues can be used to fund parking facilities, transportation programs, stormwater management programs, or other beneficial services.

### Provide Bicycle Facilities

Bicycle parking, storage, and shower/changing rooms increase the convenience and security of cycling. Bicycle parking can sometimes substitute for a portion of automobile parking.

Optimal bicycle parking supply depends on the level of cycling activity in an area and the type of destination. Some destinations, such as schools, campuses, and recreation centers, have 10 to 20 percent visitors who arrive by bicycle. To determine whether additional bicycle parking may be needed, observe entrance areas to see if bicycles frequently locked to posts and trees- and indication that bicycle parking facilities are inadequate,

either because too few bicycle racks or because existing bike racks are not well designed or located. Survey cyclists to determine what type of facilities they prefer.

It is important that bicycle facilities have appropriate design, construction, and maintenance, or cyclists will refuse to use them. There are two general categories of bicycle parking requirements:

- Short-term parking is needed where bicycles will be left for short stops. It should be located as close to destinations as possible. At least some short-term bicycle parking should be protected from the weather.
- Long-term parking is designed to accommodate bicycles that will be left for extended periods. It requires a high degree of security and weather protection with well-designed racks in covered areas, lockers, storage rooms, or fenced areas with restricted access.

Most destinations require some long-term bike storage for employees and residents and some short-term racks for customers and visitors. Locate bicycle parking where it is convenient to use, secure, visible, protected from weather, and has adequate clearance. Do not locate bicycle racks where they block pedestrian or vehicle traffic or fire hydrants. Adequate lighting and surveillance are essential for security. Bicycle racks and lockers must be well anchored to the ground to avoid vandalism and theft.

Sometimes a single storage or changing facility can serve several destinations. For example, a downtown gym can open early so bicycle commuters can shower before arriving at work; a building with a large central bicycle storage area may be managed to accommodate cyclists who work at various nearby locations.

## Support Strategies

### Improve User Information and Marketing

"User information" refers to information provided to travelers about parking availability, regulations, price, and alternative travel options. Many parking problems result in part from inadequate user information. User information can be provided by signs, maps, brochures, Web sites, and electronic guidance systems. Some systems provide real-time information.

Parking information can be incorporated into visitor materials, such as event announcements, yellow pages, and newspaper advertisements. Local governments can produce brochures and Web sites that identify the location of parking facilities, indicate parking prices, describe parking planning and management activities, explain parking regulations, describe opportunities for citizen involvement, and answer other common questions about parking issues. Destinations such as commercial centers, hospitals, and campuses, can produce an "access guide". All materials should have parking program contact information, such as a telephone number or Web site.

"Intelligent Transaction Systems" can provide useful parking information, including changeable signs and in-vehicle guidance systems that indicate parking location, availability, and price in a particular area. Some use sensors that determine which spaces are occupied, allowing signs and guidance systems to indicate where parking is currently available. The 511 area code number is reserved for transportation information, including parking services, traffic reports, and transit information.

User information is one component of marketing. "Marketing" is a general term for activities to determine consumer needs and preferences, and provide suitable services, information, and encouragement to help achieve an objective. Parking management marketing activities involve studies to help understand motorists' needs, preferences, and attitudes regarding parking options, and to identify opportunities for changing parking and travel behavior. Market studies can help planners anticipate and address possible objections to parking management strategies. It is important to educate the public about the full costs of expanding parking supply, and the full benefits of parking management programs in order to build community support for parking innovations.

### Improve Enforcement and Control

"Improve enforcement and control" means that parking regulations and pricing are enforced more effectively and more considerably. Adequate enforcement is important for many management strategies and to avoid spillover problems. As parking management activities expand, so too should enforcement activities.

To be effective and politically acceptable, the entire enforcement process must be perceived as efficient, considerate, and fair. The need for fines and punishment should be minimized by providing adequate user information and options. For example, motorists sometimes violate parking regulations simply out of ignorance, because they lack the particular coins required by a parking meter, or because they are unexpectedly delayed. Better user information and newer pricing methods can help address these problems, thus reducing violations. It may be appropriate to have exemptions to parking regulations and fines, such as "First Time Free," so the first time a motorist violates parking rules they are given information about parking regulations instead of a citation. It is useful to survey motorists who receive parking citations to determine how their parking needs can be better met and future violations avoided.



New, hand-held data systems allow enforcement officers to track individual vehicles, identifying those that overstay and habitual violators. It is important to have a system to collect outstanding parking fines. This may include use of a wheel clamp that immobilizes a vehicle, towing of vehicles with numerous unpaid fines, restrictions on renewing vehicle registrations or drivers' licenses if parking fines are outstanding, or use of collection agencies.

Parking enforcement officers and private parking operators must be given adequate training and clear guidelines on how to enforce parking rules. They should be friendly, considerate, and helpful. Parking enforcement officials and operators should strive to be perceived as helpful community ambassadors. They should provide maps and brochures about local parking options as well as general directions and tourist information.

Parking passes sold or allocated to employees, officials, or visitors should have clear limitations regarding where, when, and by who they may be used. They should be audited regularly to insure they are used as intended.

It is also important to have effective procedures for enforcing parking management agreements with developers and facility managers. For example, cities may require bonds or impose penalties if a developer fails to implement a trip reduction program or a facility manager fails to support a parking sharing agreement as promised.

#### Establish Transportation Management Associations and Parking Brokerage

Transportation management associations are private, nonprofit, member-controlled organizations that provide transportation and parking management services in a particular area, such as a commercial district, mall, or medical center. Transportation management associations can be an effective way to implement parking management programs and reduce total parking demand. Transportation management associations are typically funded through dues paid by member businesses and local government grants.

Transportation management associations can:

- Coordinate parking planning in the area.
- Maintain an inventory of parking facilities to help with parking planning and management activities.
- Perform regular parking utilization surveys.
- Provide parking brokerage services.
- Coordinate shared parking.
- Produce and distribute user information.
- Administration commuter financial incentives, such as parking cash-out.
- Coordinate shuttle services and other special public transit programs.
- Manage overflow parking programs.
- Provide bicycle parking.
- Deal with spillover problems.
- Provide other mobility management services.
- Advise on parking facility design and management.
- Advise on regulations and enforcement policies.
- Coordinate enforcement services.
- Monitor parking problems.

Transportation management associations can provide parking brokerage, that is, they can help businesses share, trade, lease, rent, and sell parking facilities. For example, they can match businesses that have extra parking supply with nearby businesses that need parking at a particular time, and help develop and enforce sharing agreements. This helps businesses deal with changing parking demands and allows businesses to benefit when their parking management associations can also be responsible for monitoring activities to identify potential problems and evaluate parking management programs effectiveness. A parking authority or parking management association can provide many of the same services as transportation management association but with a narrower scope that often excludes activities such as commute trip reduction programs.

#### Establish Overflow Parking Plans

Overflow parking plans identify the responses that will be applied when parking demand exceeds the available supply at a destination, for example, during special events, peak shopping periods, or temporary reductions in parking supply. Below are some possible components of an overflow parking plan:

- Use signs and maps to direct motorists to alternative parking facilities nearby.
- Establish shared and remote parking arrangements, with walkability improvements and shuttle services to connect them if necessary
- Provide information on parking and travel options for special event participants. For example, when people purchase tickets to a major sport or cultural event, give them a brochure or map showing the location of parking facilities and describing how to arrive by transit.
- Encourage travelers to shift their mode or use remote parking during peak periods. For example, retail employees can be required to use remote parking facilities or alternative commute modes during busy shopping periods.
- Apply special parking regulations to favor priority vehicles during busy periods.
- Provide special parking and remote parking, and valet parking to increase parking facility capacity.

- Design plazas, courtyards, and lawns so they can be used occasionally for vehicle parking.
- Provide adequate traffic and parking management staff during peak periods. Additional staff may be hired for special events.

#### Address Spillover Problems

"Spillover problems" refers to the undesirable use of off-site parking facilities, such as when business customers and employees park on nearby residential streets or use another businesses' parking lot. Concerns about spillover impacts are often used to justify excessive parking requirements and problems can directly increase parking management program acceptability and effectiveness.

- Provide information indicating where motorists may and may not park.
- Use regulations to control spillover impacts, such as time limits and permit programs on residential streets near activity centers.
- Use pricing to control spillover impacts, such as charging nonresidents to park on residential street and charging noncustomers for using parking facilities at a business.
- Compensate people who bear spillover parking impacts. For example, a high school can send complementary sport event tickets to residents of nearby streets who experience spillover parking problems.
- Establish a monitoring program to identify when and where parking spillover problems occur. This may include parking utilization surveys to identify who is parking at what location, and hotlines for residents and businesses to report problems.

#### Improve Parking Facility Design and Operation

"Parking facility design and operation" refers to physical layout, construction, and day-to-day management of parking facilities. Parking facilities are a major land use and an important portion of the public realm, that is, public spaces where members of society meet and interact. Improved design and operation can better integrate parking facilities into communities, improve the quality of service experienced by users, support parking management, and help address various problems.

Current parking planning practices tend to emphasize quantity over quality, often resulting in large but unattractive and inconvenient facilities. Increasing emphasis on quality may mean fewer, larger spaces, with more resources devoted to landscaping, walkways, maintenance, and security. A well-designed parking facility incorporates attractive materials, and amenities such as benches, washrooms, and wayfinding signs. A well-planned parking facility can serve multiple functions, such as being a courtyard and walkway, a meeting and play area, and flexible space available for festivals and markets.

Parking management both supports and is supported by improved facility design and operation. Parking management can reduce the number of parking spaces required in an area, freeing up resources for design improvements. Design and operation improvements support strategies, such as parking regulation and pricing, walkability, and improved user information.

#### *Parking Facility Design Considerations*

Below is a brief description of various parking design and operation issues. It is beyond the scope of this book deal with these in detail. Specialized publications and parking planning experts should be consulted to ensure that current best practices are applied for each of these issues.

##### *-Access Management*

The term "access management" is used by transportation professionals to describe effective coordination between roadway design and land-use development. This usually includes limits on the number of driveways on major roadways to reduce traffic congestion and accident risk, as well as encouragement for more compact land-use patterns. It supports parking management strategies, such as shared parking improved walkability, and smart growth.

##### *-Accessibility or Universal Design*

"Accessibility" refers to accommodating people with disabilities and other special needs. Parking facilities should apply current best practices to determine the number and design of spaces reserved for people with disabilities, and design features to accommodate people using wheelchairs, strollers, and handcars.

##### *-Aesthetics*

Attention to landscaping, building materials, public art, and other design features can improve parking facility appearance, and therefore the overall aesthetics of a site, street, or city. Some zoning regulations require that a portion of parking lots be devoted to landscaping and that visual screening and setbacks separate parking facilities from adjacent land uses. Parking structures can be designed to enhance the streetscape, for example, by having ground-floor retail and using high-quality materials and maintenance practices. A public review process can be used to gain community input into parking facility design.

##### *-Asset Management*

"Asset management" refers to policies and programs designed to preserve the value of infrastructure. Parking facilities require adequate maintenance and repairs for long-term durability, safety, and

aesthetics. Each facility should have an asset management plan that identifies inspection, cleaning, maintenance, repair, and reconstruction practices. Parking facilities require occasional repainting, sealing, and repaving, and major reconstruction after 20 to 30 years.

#### *-Flexibility*

Parking facilities can be designed to accommodate changing needs and temporary uses, including storage, recreation, and special events. For example, some condominium residents may want to use their parking space for bulk storage or as a work area. A parking lot may be used temporarily as a play area or market. The top floor of a parking structure could be used for an arts festival or café, particularly if it has an attractive view. The following actions can support this flexibility:

- Establish policies that allow temporary or permanent conversion of parking facilities to other uses, provided there is a management plan to address any problem that occur.
- Identify off-peak periods when excess parking can be used for other uses.
- Publish rental rates for blocks of parking spaces during off-peak periods.
- Incorporate flexibility into parking facility design.
- Provide infrastructure needed for alternative uses, such as sufficient lighting, electrical connections, and water supply.

#### *-Heat Island Effect*

The “heat island effect” refers to higher local temperatures that result from sunlight on dark surfaces, such as parking lots, roads, and building roofs. This increases summer temperatures in urban areas, which is unpleasant for parking facility users, and increases air pollution and energy consumption. Such temperature gains can be reduced by limiting pavement area, shading pavement with trees and awnings, using light-colored materials, and using turf surfaces for occasional-use parking facilities.

#### *-Preservation and Enrichment*

Parking facilities should be designed to protect and enhance historic, cultural, and natural resources. Parking facilities can incorporate design details and materials reflecting traditional building methods, and include information on unique features, such as a sign describing an event that occurred at the location, or buildings and their occupants previously located at the site. Artwork and design styles can celebrate cultural traditions. A parking lot can incorporate features of previous structures, such as an archway made from the building entrance or a portion of the foundation preserved as a border.

#### *-Lighting*

Adequate lighting is important for user comfort, safety, and security. Various standards have been established for minimum lighting in surface and structured parking lots. It is sometimes important to shield nearby residents from lighting glare.

#### *-Orientation*

“Parking facility orientation” refers to where parking lots are located with respect to street, sidewalks, and buildings. It has been common to locate parking facilities in front of buildings, but many planners now recommend locating buildings close to the sidewalk to improve pedestrian access and create more attractive streetscape, with some or all parking located behind or at the side of a building.

#### *-Security*

Security is an important design and operational issue, particularly for enclosed or isolated facilities. Parking facilities can be designed to increase security through natural surveillance, lighting patrols, emergency alarms, and closed-circuit video observation. Special security measures may be needed at certain times.

#### *-Size and Scale*

In general, several smaller parking lots are more attractive than a single large lot. Large parking facilities can be divided into smaller units with landscaping. Individual bays should generally be less than 100 feet long with 10 to 12 spaces per side. In large parking facilities, zones can be designed by symbols and color codes to help users find their vehicles. Large, surface parking facilities should be located behind buildings and at the edge of business districts, rather than in front of buildings or on major commercial streets.

#### *-Stormwater Management*

Newer stormwater management and pollution control strategies can reduce environmental impacts and infrastructure costs. For example, stormwater runoff can drain into landscaped areas and bio-swales. Grease traps may be needed to collect pollution. Total impervious surface area can be minimized and tree cover maximized. Permeable surfaces and Hollywood driveways can be used in some conditions, particularly for occasional-use parking facilities.

#### *-Traffic Calming*

“Traffic calming” refers to various design features intended to reduce vehicle traffic speeds and volumes on a particular roadway or within a parking facility. A variety of traffic-calming strategies can be used to control traffic within parking lots. Speed platforms and speed humps are generally preferable to speed bumps.

*-Traffic Circulation*

Parking lots can be designed to facilitate traffic circulation. Dead-end lanes should be avoided and multiple entrances should be provided if possible. Traffic patterns should be clearly indicated with signs and arrows.

*-Traffic Safety*

Off-street parking facilities can be designed with features to control traffic speeds, improve visibility, minimize opportunities for crashes between vehicles, and protect pedestrians. Safety features include adequate aisle and stall widths, clear sight lines, traffic controls at aisle intersections, speed controls, and separate walkways. Back-in angled parking tends to be safer than front-in angled or parallel curb parking, since drivers are better able to see as they exit into the traffic lane.

*-User Amenities*

Parking facilities can be designed with walkways, sheltered waiting areas, benches, drinking fountains, kiosks, telephones, bulletin boards, vending machines, and washrooms. Large parking structures can have enclosed lobbies, which are heated in winter and cooled in summer, where customers can wait and transact payments. Some commercial parking facilities offer services, such as washing and refueling, while a vehicle is parked. Parking facilities can have electrical hookups in cold climate areas to recharge electric vehicles.

*-User Information*

Wayfinding information should be provided in parking facilities. These can include large-scale directional signs for motorists and detailed signs, maps, and brochures for pedestrians. They should be attractive, visible, easily understood and well maintained.

*-Weather Protection*

Parking lots can be shaded with trees and awnings to increase user comfort and reduce pollution emissions from cars. Awnings are important for shade in sunny climates and to protect vehicles from snow and hail in cold climates. A premium may be charged in these covered areas.

## Conclusions and Recommendations

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### Conclusions

This parking count study revealed that there are 6,581 parking spaces in downtown Middletown. The highest recorded number of cars for this study was 4,493 between 11am and 1pm during the week. The weekend's highest recorded number of cars was 2,096 between 6pm to 8pm. Main Street is frequently at or exceeding full capacity at multiple times during the week and weekend.

### *The Parking Problem*

People parking in downtown Middletown enjoy the ability to parking on Main Street close to the locations that they are visiting. In contrast, visitors do not find it particularly convenient nor is the demand for parking so great as to force people to parking in off street lots located behind Main Street buildings. The reasons are multiple and a number of sets can be done to improve the experience and attraction of parking in off-street lots off of Main Street. The problem is not one of capacity not meeting demand, but one of facilities not encouraging or facilitating that inadequate to foster demand at multiple times of the day and supporting multiple destinations. Too many parking lots see only peak usage and singular periods during and some do not get anywhere near to full capacity. Main Street is the only parking facility that is efficiently utilized throughout the entire day.

### *Middlesex Hospital's Parking Problem*

Middlesex Hospital has the one true parking capacity problem. The Hospital would need to have a facility of at least 350 parking spaces to address employee parking. Ideally, campus parking should benefit patient and visitor needs and off campus parking would address employee needs. Current, the Hospital leases parking at various locations around Middletown. A single location would better serve the Hospital and allow for better flexibility is an actual capacity problem were to affect downtown parking in general in the future. One possible solution is discussed below under "decked facilities".

### Recommendations

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The following will discuss various opportunities or measures that could increase the attraction to off-street parking in Middletown.

### *Walkability*

With the exception of Middlesex Plaza, most rear lots are not anywhere near full capacity. Major reasons for this is the lack of walkability, lack of direct connectivity to Main Street, and distance issues. For example the Kidcity lot is isolated with no shortcut to Main Street and existing routes for pedestrians to walk to Main Street do not provide the safe and pleasing walk that would encourage parking. On the other hand Middlesex Plaza is an example of an off street lot that has a direct connection to Main Street. The courtyard like setting provides pedestrians with a safe and pleasant experience.

The following recommendations would enhance the walkability of existing off-street parking.

- Kidcity lot- This lot is isolated, as previous stated, and one method to correct this is to create a pedestrian corridor along the north side of the Holy Trinity Church. This concept could be extend, by acquisition of the rear lot between Holy Trinity Church and St. Luke's building and create a large uniform lot out of the existing Kidcity and Library lot. This would allow the southern side of Holy Trinity Church to also be turned into a pedestrian corridor and the public lot could provide enough parking for the Holy trinity Church on Sundays and St. Luke's in the evening. Reserved parking probably would only be needed for Holy Trinity staff and discount parking or free parking could be provide for St. Luke's

- Arcade Parking Deck- More will be discussed about parking decks below, but one improve to improve walkability is to shorten the distance between parking and Main Street. This can be accomplished by extending the deck over the police parking lot. The result would put parking at a similar distance as the Middlesex Plaza lot.

- Metro Square Lot- The currently exist two connection points to Main Street from this lot. The first one is located at the Northwestern corner and the second one is located at the Southwestern corner. A third connection could be created between the space that exists between the Dunkin Donuts and the new Osaka Japanese Steakhouse. Creating connectivity will only enhance the convenience of parking off of Main Street.

### *Increase On-Street Parking*

Why not give the public what they want! People like to come to downtown and parking on Main Street. Increasing on-street parking could help not only help increase supply, but in some areas could act as a way to lure motorist to off-street parking. Currently, off-street parking seems to far for motorists to consider, they would rather troll for an Main Street space as one becomes available. Furthermore, people are visiting Middletown are willing to pay for on-street parking, therefore increasing metered locations could help increase revenues.

There are a number of locations where on-street capacity could be increased:

- Dekoven Drive- The existing City vehicle restricted parking should be removed and changed to 10 metered parking spaces. City vehicles can be absorbed by the employee lot. Other sections of Dekoven Drive, such as between Ferry Street and Green Street should be studies to see if on-street parking can be created.

- Court Street- The existing on street parking should be reallocated for public metered use, and the City vehicles should park in the City employee lot. Furthermore the street area in front of the Sons of Italy building and the Probate Court building should be reallocated from parallel on-street parking, and reduce the two west-bound lands to one. The remainder of the west-bound section can remain two lanes.

- Dingwall Drive & Martin Luther King Drive- Each of these streets could be changed to one-way streets and allow for on-street parking, either parallel or angled.

-Union Street- Once the State completes the proposed Route 9 changes, Union Street will become less of a thoroughfare for people going from Main Street to Route 9. The potential exists for removing one travel lane in each direction and reorient the parallel parking to angled parking.

#### *Existing Reserved Spaces*

Middletown should reconsider its allocation and designation of reserved spaces. In a number of locations, reserved spaces are located at the most desirable section of public lots. Two examples include are, first, the lower level of the Arcade, a large number of police department reserved spaces are the ones located the closest to Main Street. People wishing to visit Main Street are discouraged from use this lot. Second, the parking lot next to Eli Cannon's has reserved spaces for the Community Health Center located along the streets of Main and Grand. The unreserved metered spaces are located in the rear of the lot. The allocation makes it seem that the entire lot is reserved for the Community Health Center. Rearranging the lot to have the spaces closest to the street metered for public use will make it easier for the know that this lot available for use. Other locations where this type of improvement could be implemented is the public lot next to the roller rink in the North End and the lot behind the Artist's Co-op. Furthermore, reserved spaces should not be reserved 24-hours a day, 7-days a week, they should be clearly marked when they are restricted for the organization they serve. Business, should only be reserved during business hours and residential parking should be only be reserved during evening hours and weekends.

#### *Increase Shared Parking*

Related to reserved parking in increasing the ability for off-street parking lots to act as shared lots. As described in the best practices section, shared lots serve multiple destination, often destinations that have different peak periods of use. For example the parking lot located behind the Artist Co-op could be reserved during the day for the Community Health Center and in the late afternoon and early evening be reserved for the Green Street Arts Center.

#### *Decked Facilities*

Decked facilities are not the first choice for parking by visitors to Middletown. Decked facilities work better to get employees and people expecting to park for a period of longer than two hours. The most efficient decked facilities in Middletown exist to serve the Hospital and the Middlesex Mutual Building. The Parking Arcade is efficient in serving visitors to the Courthouse. However all of these lots are not efficient in serving the public who are not visiting either of the before mentioned institutions. Sometimes the Parking Arcade works as overflow parking for Metro Square. As mentioned about extending the deck towards Main Street could improve use of this facility.

There are at least three possible locations to building decked facilities around downtown to increase parking. They are the following:

- Kidcity lot- The existing slope of the lot could allow for a deck with access from Broad Street and a lower level with access from Washington Street. The issues with such as design is that increased parking will not benefit Main Street with out a better connection to Main Street as discussed above. Furthermore, will mothers with children want to parking in the lower level of parking deck. Will they consider it safe. An finally, an upper deck would primarily serve San Sebastian Church and the Russell Library. Both institutions are adequately served by the existing number of parking spaces. Increasing capacity might not yield increased utilization without successful connection to Main Street.
- Middlesex Plaza- Just as the Kidcity lot, a deck could take advantage of the existing slope. The current lot is adequate for existing demand. However, the vacant area at the corner of Broad and College, could be developed and increasing parking at this location would be ideal. The main issue is if there is not internal method to go from deck to deck, will the lot be utilized.
- Rear of Inn of Middletown and Middletown Press Building- This is perhaps the most promising location of the three. The reason is that a deck facility could serve three destinations that would guarantee parking. The Hospital and Inn at Middletown need parking. The Hospital would use the facility during the day and the Inn at Middletown during the nights and weekends. This is the ideal shared facility. Rivers Edge could also benefit. There may also be the opportunity to design parking deck to allow development along the street with parking in the rear. This could be a benefit but decreasing the distance between Main Street downtown and the South Cove development that is currently proposed for the riverfront.

#### *Creation of New Off-street Parking Lots*

The North End is the one section of the downtown that is overly dependent on on-street parking. While there currently is sufficient capacity, looking to the future, off-street parking will be a major component of repopulating the downtown. The Central Core and the South End have to opportunity to create shared parking opportunities for residents to purchase or be assigned off-street parking. The North End lacks this opportunity. Possible locations would require possible acquisition and demolition. The following are possible locations:

- 12 Liberty Street- This is a lot with a vacant building, which could be converted to garage parking, for residents who would like to have their cars protected from the elements. The building could also be demolished, which could provide for greater capacity. This location is also ideal for shared parking with the Community Health Center during the day, and possibly reduce the dependence on the lot located at the corner of Grand and Main Street.
- 9 & 13 Liberty Street- These building could be demolished and provide the ability to expand the public parking lot located next to the roller skating rink. Shared parking potential exists here as well.
- Rear of 494, 502, & 512 Main Street- the existing parking lot behind the La Boca Restaurant and Middletown Framing could be improved and better laid out. Both alleyways would need to be acquired, in order to allow a dedicated entrance and dedicated exit. This lot would be idea to provide for employee parking for Main Street

business during the day and residential parking in the evenings and weekends. It would need to be explored if public parking is a feasible option.

*Policy Changes*

*Elimination of Parking Requirements*

The City of Middletown should consider the elimination of Off-Street Parking requirements for the B1 zone, possibly replace them with parking guidelines that encourage shared parking. If Off-Street Parking requirements can not be eliminated than any on-street parking should be credited to the number of required parking spaces.

*Creation of a Parking Brokerage*

The Creation of a parking brokerage could help in the trading of existing parking spaces to organizations that need them and benefit the organizations that own these spaces but do not necessarily need them. See "Establish Transportation Management Associations and Parking Brokerage " in the best Practices Section of this study.



## **Appendix**

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**Appendix I- Weekday Parking Count**

Block	Location	Spaces	5am-7am	11am-1pm	6pm-8pm	10pm-12pm
24 23-42	80 South Main- Parking Lot	98	1	98	21	8
	28 Crescent- Hospital General Parking	250	16	249	180	54
	28 Crescent- Hospital Garage	298	85	281	137	113
	Street- South Main Street (E)	6	1	7	1	1
	Street- Main Street Extension (W)	30	5	25	2	1
24 23-39	77 Crescent Street- Rear (Main St Ext side)	8	1	4	3	1
	15 Pleasant Street- Board House Rear	15	10	10	17	10
	55 Crescent Street Rear	6	0	6	6	2
	49 Crescent Street Rear	10	5	3	5	4
	41/45 Crescent Street Rear	18	4	15	6	3
	33 Pleasant Street- Masonic Building Rear	10	2	16	6	1
	22 South Main- D'Angelo Funeral Home Rear	39	3	10	30	3
	27 Pleasant Street- Sterling Rear	12	0	8	1	0
	21 Pleasant Street- Rear	22	0	17	18	0
	Street- Crescent Street (N)	22	10	20	18	9
	Street- Crescent Street (S)	5	0	4	2	0
	Street- South Main Street (W)	13	0	11	5	1
	Street- Main Street Extension (W)	0	0	0	0	0
34 24-9	1 MacDonough Place- Rear	20	5	12	4	6
	55 DeKoven Drive- YMCA	104	24	79	73	16
	1 James Moses- YMCA- E2	134	0	157	10	1
	Street- Main Street Extension (E)	22	6	20	4	3
	Street- MacDonough Place	10	2	7	4	0
	Street- James Moses Avenue	9	0	6	0	0
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- Union Street (S)	18	7	8	0	0
34 24-5	30 Dekoven Drive- Rental Center	29	0	9	0	0
	60 DeKoven Drive- Personal Auto	40	17	38	25	25
	Street- DeKoven Drive (E)	0	0	0	0	0
	Street- Union Street (S)	0	0	0	0	0
34 24-1	40 Union Street- Middletown Plate & Glass	41	0	25	0	0
	100 DeKoven Drive- Beautiful Bath	32	1	9	2	1
	Street- Union Street (N)	0	0	0	0	0
	Street- DeKoven Drive (E)	0	0	0	0	0
24 23-25	100 Main Street- Brooks- MLK	19	0	13	18	0
	100 Main Street- Brooks- Rear	13	2	7	13	2
	70 Main Street- Inn at Middletown- Rear	15	13	4	13	12
	48 Main Street- William Reavis Rear	18	0	8	4	2
	20 Main Street- Middletown Press- Rear	105	5	55	45	21
	111 DeKoven Drive- Rivers Edge	144	100	50	85	100
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- MLK (S)	0	0	0	0	0
	Street- Main Street (E) (Metered)	10	7	7	13	11
	Street- Union Street (N)	20	12	16	15	10
24 17-56	130 Main Street- Metro Square	295	15	122	151	50

	130 Main Street- Metro Square- Rear	56	0	5	1	1
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- Dingwell Drive (S)	0	0	0	0	0
	Street- Main Street (E) (Metered)	29	7	24	25	4
	Street- MLK (N)	0	0	0	0	0
22 17-53	195 DeKoven Drive- TV Retail Building	53	24	30	19	18
	Court Street- Arcade- Upstairs	177	0	108	57	6
	Dingwall Drive- Arcade- Downstairs	189	26	123	35	24
	222 Main Street- Police Station-Rear	65	30	38	30	36
	1 Court Street- Court House- Employees	365	0	365	0	0
	Street- DeKoven Drive (W)	0	0	1	0	0
	Street- Court Street (S)	0	0	0	0	0
	Street- Main Street (E) (Metered)	14	1	17	16	0
	Street- Dingwell Drive (N)	0	0	0	0	0
22 17-52	245 DeKoven Drive- City Hall- Rear	22	1	18	11	0
	245 DeKoven Drive- City Hall- Employees	87	1	68	14	1
	Washington Street- Milleli Plaza	176	18	142	161	27
	74 Court Street- Sons of Italy	27	1	11	15	5
	124 Court Street	12	0	10	3	0
	366 Main Street- Main Street Market	27	0	19	8	2
	340 Main Street- MTA Bus Station	8	1	3	0	0
	27 Washington Street- DeKoven House	21	3	15	16	3
	Street- DeKoven Drive (W)	10	0	1	0	0
	Street- Washington Street (S)	0	0	0	0	0
	Street- Main Street (E) (Metered)	37	1	29	41	4
	Street- Court Street (N)	6	0	3	1	0
22 17-47	512 Main Street- La Boca Rear	50	0	38	22	8
	Main Street- Middletown Framing	7	1	2	0	0
	36 Washington Street- National Paint	29	1	9	3	1
	44 Washington Street- Diana Salon	31	1	2	1	0
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- Ferry Street (S)+ Bottom Lot	18	9	13	10	10
	Street- Main Street (E) (Metered)	24	2	24	24	22
	Street- Washington Street (N)	0	0	0	0	0
	Street- Alsop Avenue	4	1	2	3	2
22 17-37	51 Main Street- Green Street Arts Center	18	6	14	16	5
	594 Main Street- MasterSupply- Rear	10	7	3	7	7
	584 Main Street- Shliens- Rear	6	5	6	7	6
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- Green Street (S)	0	0	0	0	0
	Street- Main Street (E) (Metered)	15	10	9	6	8
	Street- Ferry Street (N) (after Richman 11 spaces)	0	0	0	0	0
22 17-36	60 Green Street- Artist Coop- Rear	39	19	37	13	18
	47 Rapallo Avenue- Vacant Lot	22	12	10	10	17
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- Rapallo Avenue (S)	14	3	11	6	7
	Street- Main Street (E) (Metered)	10	0	5	4	1
	Street- Green Street (N)	17	8	5	6	6

22 17-29	710 Main Street- Church Rear	32	10	7	12	8
	Street- Main Street (E) (Metered)	11	7	9	8	4
	Rapallo Avenue (N)	8	4	9	4	6
22 17-28	675 Main Street- Eli Cannon's Parking	55	5	33	49	18
	Street- Spring Street (N) to MacDonough School	11	4	3	8	6
	Street- Spring Street (S) to MacDonough School	18	10	7	14	11
	Street- Main Street (W) (Metered)	12	0	2	12	8
	Street- Grand Street (N) to Pearl	18	8	6	4	7
22 17-35	631 Main Street- CHC Parking	28	0	23	6	0
	Street- Grand Street (S) to Pearl	0	0	0	1	0
	Street- Main Street (W) (Metered)	11	0	5	9	0
	Street- Liberty Street (N) to Pearl	29	12	9	10	12
22 17-46	465 Main Street- Luce Parking	51	4	29	42	9
	515 Main Street- Salvation Army Rear	34	0	12	2	0
	505 Main Street- Rear	13	0	12	10	0
	567 Main Street-Roller Rink Parking	32	1	18	6	4
	138 Washington Street- Rear	31	14	15	12	14
	Street- Liberty Street (S) to Pearl	0	0	0	0	0
	Street- Main Street (W) (Metered)	21	2	6	15	10
	Street- Washington Street (N)	0	0	0	0	0
22 17-51	119 Washington Street- KidCity Rear	105	0	64	59	2
	395 Main Street- Amato's Rear	22	0	12	0	0
	111 Washington Street- Wachovia Parking	14	0	6	2	0
	363 Main Street- Library/Pedal Power	47	0	22	39	2
	144 Broad Street Holy Trinity/St. Lukes	21	6	10	19	5
	138 Broad Street- Marilyn Mills Rear	15	1	5	0	1
	129 Washington Street- Broad/Washington	15	0	15	6	0
	190 Court Street- First Church	30	1	20	13	1
	210 Court Street- Corner Court/Broad	54	0	38	3	0
	315 Main Street- Liberty(N)- Rear	25	1	11	5	1
	Street- Washington Street (S)	0	0	0	0	0
	Street- Main Street (W) (Metered)	37	0	38	36	1
	Street- Court Street (N) (Metered)	12	0	8	8	3
	Street- Broad Street (E)	0	0	0	0	0
22 17-55	118 Court Street- Middlesex Mutual Parking Deck	1074	44	827	60	0
	291 Main Street- Liberty(S)- Rear	12	1	8	1	1
	225 Main Street- Citizens- Rear	11	0	6	3	0
	255 Main Street- Citizens/Bank of America	27	0	11	14	0
	271 Main Street- Bank of America/Liberty	18	0	10	11	1
	Street- Court Street (S) (Metered)	12	0	9	7	0
	Street- Main Street (W) (Metered)	10	0	9	10	0
	Street- College Street (N)	0	0	0	0	0
	Street- Broad Street (E)	0	0	0	0	0
24 23-30	70 Broad Street- SNET Building Upper Lot	33	3	12	3	3
	70 Broad Street- SNET Building Lower Lot	30	0	2	0	0
	Broad Street- Sbona Tower	44	36	35	34	38
	College Street- Middlesex Plaza	114	3	108	54	7
	Street- College Street (S)	0	0	0	0	0

	Street- Main Street (W) (Metered)	27	1	24	27	2
	Street- Williams Street (N)	18	0	15	17	0
	Street- Broad Street (E)	0	0	0	0	0
24 23-34	14 Church Street- Doolittle Funeral Home Rear	19	0	16	0	0
	22 Church- FUMC	23	0	21	22	0
	18/24/28 Broad- Page Warner Auto Body/18 Broad Rear	38	18	29	25	19
	151 William Street- Big A Driving School	8	1	4	1	1
	William Street- Across from Senior Center	20	1	14	5	1
	Law Offices-Rear/Baptist Church- Side	17	1	16	3	0
	Baptist Church Rear	28	0	20	7	0
	Street- Williams Street (S)	0	0	0	0	0
	Street- Main Street (W) (Metered)	15	13	7	15	15
	Street- Old Churh Street	28	9	33	16	6
	Street- Broad Street (W/E)+ South Green	8	0	5	3	1
24 23-29	45 Broad Street- Broad Street Books	53	11	24	15	13
	56 Hamlin Street- Parking lot	58	2	1	2	1
	William Street- CRT Rear	27	5	17	5	6
24 23-27	Street- College Street (S)	12	2	6	8	7
	Street- Broad Street (W) (Metered)	12	0	3	3	0
	Street- Williams Street (N)	15	11	7	9	9
	Street- Hamlin Street (E)	9	7	4	6	6
	Street- Hamlin Street (W)	0	0	0	0	0
	Street- Court Street (S)	0	0	0	0	0
	Street- Broad Street (W)(Metered)	11	0	4	6	0
	Street- College Street (N)	9	7	9	5	6
22 17-50	234 Court Street- Library Admin Building	18	0	13	16	0
	155 Washington Street- San Sebastian	60	0	5	18	0
	Street- Washington Street (S)	0	0	0	0	0
	Street- Broad Street (W) (Metered)	8	0	10	10	0
	Street- Court Street (N)	9	3	7	3	1
33 24-3	Harbor Park- South	15	0	0	4	1
	Harbor Park- Middle	38	0	2	5	4
	Harbor Park- North	82	1	13	19	4
	Harbor Park Drive Lot	44	0	0	1	0
	Street- Harbor Park Drive	0	0	0	0	0

**Appendix II- Weekend Parking Count**

Block	Location	Spaces	5am-7am	11am-1pm	6pm-8pm	10pm-12pm
24 23-42	80 South Main- Parking Lot	98	4	39	10	7
	28 Crescent- Hospital General Parking	250	16	126	106	34
	28 Crescent- Hospital Garage	298	73	142	112	103
	Street- South Main Street (E)	6	0	0	0	0
	Street- Main Street Extension (W)	30	3	2	1	1
24 23-39	77 Crescent Street- Rear (Main St Ext side)	8	0	0	0	0
	15 Pleasant Street- Board House Rear	15	11	11	11	10
	55 Crescent Street Rear	6	0	2	0	0
	49 Crescent Street Rear	10	6	2	1	5
	41/45 Crescent Street Rear	18	3	10	5	11
	33 Pleasant Street- Masonic Building Rear	10	1	4	3	3
	22 South Main- D'Angelo Funeral Home Rear	39	2	2	3	3
	27 Pleasant Street- Sterling Rear	12	0	5	0	0
	21 Pleasant Street- Rear	22	0	1	1	1
	Street- Crescent Street (N)	22	11	15	7	13
	Street- Crescent Street (S)	5	1	2	1	1
	Street- South Main Street (W)	13	0	0	2	9
	Street- Main Street Extension (W)	0	0	0	0	0
34 24-9	1 MacDonough Place- Rear	20	5	10	8	5
	55 DeKoven Drive- YMCA	104	13	50	14	14
	1 James Moses- YMCA- E2	134	1	2	0	0
	Street- Main Street Extension (E)	22	0	3	0	0
	Street- MacDonough Place	10	2	5	5	4
	Street- James Moses Avenue	9	0	0	0	0
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- Union Street (S)	18	2	12	1	0
34 24-5	30 Dekoven Drive- Rental Center	29	0	4	0	0
	60 DeKoven Drive- Personal Auto	40	18	23	20	20
	Street- DeKoven Drive (E)	0	0	0	0	0
	Street- Union Street (S)	0	0	0	0	0
34 24-1	40 Union Street- Middletown Plate & Glass	41	0	11	0	0
	100 DeKoven Drive- Beautiful Bath	32	0	3	0	0
	Street- Union Street (N)	0	0	0	0	0
	Street- DeKoven Drive (E)	0	0	0	0	0
24 23-25	100 Main Street- Brooks- MLK	19	0	0	5	2
	100 Main Street- Brooks- Rear	13	2	2	5	2
	70 Main Street- Inn at Middletown- Rear	15	10	4	12	14
	48 Main Street- William Reavis Rear	18	3	6	10	18
	20 Main Street- Middletown Press- Rear	105	25	36	38	16
	111 DeKoven Drive- Rivers Edge	144	102	80	80	91
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- MLK (S)	0	0	0	0	0
	Street- Main Street (E) (Metered)	10	11	5	9	10
	Street- Union Street (N)	20	11	11	3	9
24 17-56	130 Main Street- Metro Square	295	19	98	266	127

	130 Main Street- Metro Square- Rear	56	0	2	17	6
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- Dingwell Drive (S)	0	0	0	0	0
	Street- Main Street (E) (Metered)	29	6	22	32	7
	Street- MLK (N)	0	0	0	0	0
22 17-53	195 DeKoven Drive- TV Retail Building	53	9	16	8	8
	Court Street- Arcade- Upstairs	177	0	24	72	17
	Dingwall Drive- Arcade- Downstairs	189	29	46	49	32
	222 Main Street- Police Station-Rear	65	43	42	35	35
	1 Court Street- Court House- Employees	365	0	0	0	0
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- Court Street (S)	0	0	0	0	0
	Street- Main Street (E) (Metered)	14	0	17	16	14
	Street- Dingwell Drive (N)	0	0	0	0	0
22 17-52	245 DeKoven Drive- City Hall- Rear	22	0	4	3	0
	245 Dekoven Drive- City Hall- Employees	87	0	0	0	0
	Washington Street- Milleli Plaza	176	15	107	119	54
	74 Court Street- Sons of Italy	27	0	20	26	10
	124 Court Street	12	0	2	1	0
	366 Main Street- Main Street Market	27	0	15	5	5
	340 Main Street- MTA Bus Station	8	0	3	2	0
	27 Washington Street- DeKoven House	21	3	2	4	3
	Street- DeKoven Drive (W)	10	0	0	0	0
	Street- Washington Street (S)	0	0	0	0	0
	Street- Main Street (E) (Metered)	37	3	39	41	25
	Street- Court Street (N)	6	0	0	0	0
22 17-47	512 Main Street- La Boca Rear	50	0	6	31	29
	Main Street- Middletown Framing	7	0	2	0	0
	36 Washington Street- National Paint	29	2	4	2	1
	44 Washington Street- Diana Salon	31	1	1	2	0
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- Ferry Street (S)+ Bottom Lot	18	14	16	15	12
	Street- Main Street (E) (Metered)	24	9	23	26	21
	Street- Washington Street (N)	0	0	0	0	0
	Street- Alsop Avenue	4	1	1	1	1
22 17-37	51 Main Street- Green Street Arts Center	18	8	7	9	9
	594 Main Street- MasterSupply- Rear	10	8	7	9	7
	584 Main Street- Shliens- Rear	6	5	3	3	5
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- Green Street (S)	0	0	0	0	0
	Street- Main Street (E) (Metered)	15	1	10	15	10
	Street- Ferry Street (N) (after Richman 11 spaces)	0	0	0	0	0
22 17-36	60 Green Street- Artist Coop- Rear	39	22	17	17	19
	47 Rapallo Avenue- Vacant Lot	22	13	11	14	17
	Street- DeKoven Drive (W)	0	0	0	0	0
	Street- Rapallo Avenue (S)	14	7	5	5	8
	Street- Main Street (E) (Metered)	10	1	9	9	3
	Street- Green Street (N)	17	6	3	2	2



22 17-29	710 Main Street- Church Rear	32	10	10	8	10
	Street- Main Street (E) (Metered)	11	6	11	6	4
	Rapallo Avenue (N)	8	6	6	8	11
22 17-28	675 Main Street- Eli Cannon's Parking	55	6	11	32	31
	Street- Spring Street (N) to MacDonough School	11	9	6	5	7
	Street- Spring Street (S) to MacDonough School	18	10	8	14	13
	Street- Main Street (W) (Metered)	12	0	9	11	12
	Street- Grand Street (N) to Pearl	18	6	7	8	10
22 17-35	631 Main Street- CHC Parking	28	0	2	0	0
	Street- Grand Street (S) to Pearl	0	0	0	0	0
	Street- Main Street (W) (Metered)	11	0	6	3	1
	Street- Liberty Street (N) to Pearl	29	12	6	6	9
22 17-46	465 Main Street- Luce Parking	51	3	17	46	19
	515 Main Street- Salvation Army Rear	34	0	1	0	0
	505 Main Street- Rear	13	0	1	0	0
	567 Main Street-Roller Rink Parking	32	3	15	13	6
	138 Washington Street- Rear	31	15	10	15	13
	Street- Liberty Street (S) to Pearl	0	0	0	0	0
	Street- Main Street (W) (Metered)	21	4	19	19	18
	Street- Washington Street (N)	0	0	0	0	0
22 17-51	119 Washington Street- KidCity Rear	105	0	73	13	3
	395 Main Street- Amato's Rear	22	1	11	6	1
	111 Washington Street- Wachovia Parking	14	0	10	0	0
	363 Main Street- Library/Pedal Power	47	0	36	34	0
	144 Broad Street Holy Trinity/St. Lukes	21	6	14	5	6
	138 Broad Street- Marilyn Mills Rear	15	1	1	1	1
	129 Washington Street- Broad/Washington	15	0	0	5	1
	190 Court Street- First Church	30	0	10	7	1
	210 Court Street- Corner Court/Broad	54	0	6	0	0
	315 Main Street- Liberty(N)- Rear	25	2	3	21	2
	Street- Washington Street (S)	0	0	0	0	0
	Street- Main Street (W) (Metered)	37	1	37	38	14
	Street- Court Street (N) (Metered)	12	0	16	12	2
	Street- Broad Street (E)	0	0	0	0	0
22 17-55	118 Court Street- Middlesex Mutual Parking Deck	1074	0	48	0	0
	291 Main Street- Liberty(S)- Rear	12	0	4	0	0
	225 Main Street- Citizens- Rear	11	0	5	11	3
	255 Main Street- Citizens/Bank of America	27	0	9	26	14
	271 Main Street- Bank of America/Liberty	18	1	6	10	3
	Street- Court Street (S) (Metered)	12	0	5	15	0
	Street- Main Street (W) (Metered)	10	0	8	9	5
	Street- College Street (N)	0	0	0	0	0
	Street- Broad Street (E)	0	0	0	0	0
24 23-30	70 Broad Street- SNET Building Upper Lot	33	6	6	6	6
	70 Broad Street- SNET Building Lower Lot	30	0	1	0	0
	Broad Street- Sbona Tower	44	38	26	39	35
	College Street- Middlesex Plaza	114	5	33	101	49
	Street- College Street (S)	0	0	0	0	0

	Street- Main Street (W) (Metered)	27	3	19	29	4
	Street- Williams Street (N)	18	0	4	0	0
	Street- Broad Street (E)	0	0	0	0	0
24 23-34	14 Church Street- Doolittle Funeral Home Rear	19	0	1	0	0
	22 Church- FUMC	23	1	9	1	1
	18/24/28 Broad- Page Warner Auto Body/18 Broad Rear	38	21	30	22	21
	151 William Street- Big A Driving School	8	1	4	1	1
	William Street- Across from Senior Center	20	1	4	1	1
	Law Offices-Rear/Baptist Church- Side	17	1	0	0	0
	Baptist Church Rear	28	0	1	0	0
	Street- Williams Street (S)	0	0	0	0	0
	Street- Main Street (W) (Metered)	15	15	2	14	15
	Street- Old Church Street	28	13	11	13	9
	Street- Broad Street (W/E)+ South Green	8	0	8	0	1
24 23-29	45 Broad Street- Broad Street Books	53	14	24	8	17
	56 Hamlin Street- Parking lot	58	1	0	3	2
	William Street- CRT Rear	27	5	4	5	4
	Street- College Street (S)	12	5	5	5	5
	Street- Broad Street (W) (Metered)	12	0	3	1	3
	Street- Williams Street (N)	15	9	4	5	9
	Street- Hamlin Street (E)	9	8	1	8	8
	Street- Hamlin Street (W)	0	0	0	0	0
24 23-27	Street- Court Street (S)	0	0	0	0	0
	Street- Broad Street (W)(Metered)	11	0	0	4	0
	Street- College Street (N)	9	7	7	6	6
22 17-50	234 Court Street- Library Admin Building	18	0	2	0	0
	155 Washington Street- San Sebastian	60	0	1	60	0
	Street- Washington Street (S)	0	0	0	0	0
	Street- Broad Street (W) (Metered)	8	0	8	7	0
	Street- Court Street (N)	9	0	5	2	2
33 24-3	Harbor Park- South	15	1	5	0	0
	Harbor Park- Middle	38	1	29	4	3
	Harbor Park- North	82	3	13	15	10
	Harbor Park Drive Lot	44	0	1	0	0
	Street- Harbor Park Drive	0	0	0	0	0

**Appendix III- Land-use & Off-Street Parking Requirement Count**

Block	Area	Building Footprint	%	Off-Street Parking Footprint	%
24 23-42	400017	135,310	34%	117,335	29%
24 23-39	146348	36,955	25%	32,212	22%
34 24-9	156187	52,277	33%	63888	41%
34 25-5	101207	18,863	19%	25998	26%
34 24-1	85002	14,512	17%	28908	34%
24 23-25	170113	42,633	25%	107339	63%
24 17-56	159515	81,256	51%	136165	85%
22 17-53	193733	47,148	24%	70164	36%
22 17-52	250883	105,290	42%	97331	39%
22 17-47	172575	91,779	53%	38413	22%
22 17-37	116760	30,488	26%	8201	7%
22 17-36	86991	37,515	43%	15652	18%
22 17-29	73319	20,169	28%	12315	17%
22 17-28	303657	36,311	12%	14954	5%
22 17-35	95853	26,155	27%	10779	11%
22 17-46	347026	27,681	8%	34843	10%
22 17-51	209286	88,741	42%	109552	52%
22 17-55	135461	42,783	32%	14276	11%
24 23-30	143744	42,119	29%	70669	49%
22 23-34	148157	48,155	33%	53024	36%
24 23-29	122692	35,844	29%	48524	40%
24 23-27	61057	20,356	33%	0	0%
22 17-50	166279	46,274	28%	23211	14%
33 24-3	241334	15,638	6%	42914	18%
Total	4,087,196	1,144,252	28%	1,176,667	29%

Block		Total Building Area		Total Parking Area
24 23-42		272574		154,208
24 23-39		86440		32,212
34 24-9		149484		63888
34 25-5		18863		25998
34 24-1		20400		28908
24 23-25		221702		107339
24 17-56		100000		136165
22 17-53		90,000		141344
22 17-52		316888		97331
22 17-47		216,473		38413
22 17-37		78,482		8201
22 17-36		91,733		15652
22 17-29		58,555		12315
22 17-28		40,000		14954
22 17-35		136,630		10779
22 17-46		133,562		34843
22 17-51		279,450		109552
22 17-55		272,604		175853
24 23-30		181,850		70669

22 23-34		77179		53024
24 23-29		74985		48524
24 23-27		42367		0
22 17-50		36245		23211
33 24-3		20196		42914
Total		3,016,662		1,446,297

Block	Required Parking by Zoning	Off-Street Parking	Peak Use of Off-Street Parking
24 23-42	909	646	628
24 23-39	288	140	92
34 24-9	498	258	248
34 25-5	63	69	47
34 24-1	68	73	34
24 23-25	739	314	178
24 17-56	333	351	156
22 17-53	300	849	664
22 17-52	1056	380	286
22 17-47	722	117	51
22 17-37	262	34	30
22 17-36	306	61	47
22 17-29	195	32	12
22 17-28	133	55	49
22 17-35	455	28	23
22 17-46	445	161	86
22 17-51	932	348	203
22 17-55	909	1142	862
24 23-30	606	221	157
22 23-34	257	153	120
24 23-29	250	138	42
24 23-27	141	0	0
22 17-50	121	78	34
33 24-3	67	179	29
Total	10056	5,827	4,078